Vol. 1084 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1076 O.G. 3 on Mar. 3, 1987.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

Domestic PCT Fees for Chapter II, effective July 1, 1987, were announced in the *Official Gazette* at 1079 O.G. 32 on June 16, 1987.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Apr. 1, 1987 and was announced in the *Official Gazette* at 1077 O.G. 3 on Apr. 7, 1987.

International PCT fees were changed due to differences in the exchange rate and International PCT Chapter II fees effective July 1, 1987 were announced in the *Official Gazette* at 1079 O.G. 50 on June 23, 1987.

The national fees effective July 1, 1987 for entering the U.S. Patent and Trademark Office as a designated or elected Office as announced in the *Official Gazette* at 1079 O.G. 32, on June 16, 1987 are included for convenience of applicants.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	520.00
—Corresponding prior U.S. national application filed:	350.00
—Supplemental search fee, per additional invention	140.00
European Patent Office as Searching Authority	1180.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority	370.00
—Additional examination fee, per additional invention	125.00
—Searching Authority not the USPTO	570.00
—Additional examination fee, per additional invention	190.00
International fees	
Basic fee:	485.00
Basic Supplemental fee (for each page over 30):	10.00
Designation fee for the first 10 national or regional offices:	120.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee	150.00
Supplement to the handling fee	150.00

U.S. National Stage fees

	Small Entity	Non-Small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	150.00	300.00
USPTO was ISA but not IPEA	170.00	340.00
USPTO was neither ISA nor IPEA	225.00	450.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(1) to (4)	25.00	50.00
—For each independent claim in excess of 3	17.00	34.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	55.00	110.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	55.00	110.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	26.00	26.00

June 2, 1987.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on November 6, 1984, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,480,339 through 4,481,678
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and

(h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED AUGUST 23, 1987, DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,399,567	06/254,978	8/23/83
4,399,578	06/295,112	8/23/83
4,399,583	06/316,062	8/23/83
4,399,584	06/286,630	8/23/83
4,399,591	06/357,980	8/23/83
4,399,595	06/233,542	8/23/83
4,399,596	06/320,969	8/23/83
4,399,599	06/281,139	8/23/83
4,399,618	06/306,918	8/23/83
4,399,625	06/332,350	8/23/83
4,399,636	06/313,452	8/23/83
4,399,637	06/227,548	8/23/83
4,399,649	06/268,186	8/23/83
4,399,652	06/294,918	8/23/83
4,399,659	06/296,665	8/23/83
4,399,661	06/404,781	8/23/83
4,399,670	06/366,005	8/23/83
4,399,679	06/317,069	8/23/83
4,399,683	06/326,487	8/23/83
4,399,701	06/268,181	8/23/83
4,399,705	06/307,581	8/23/83
4,399,708	06/334,143	8/23/83
4,399,716	06/228,510	8/23/83
4,399,720	06/379,252	8/23/83
4,399,721	06/296,836	8/23/83
4,399,722	06/241,224	8/23/83
4,399,726	06/247,842	8/23/83
4,399,728	06/246,851	8/23/83
4,399,729	06/229,784	8/23/83
4,399,732	06/297,270	8/23/83
4,399,733	06/297,459	8/23/83
4,399,754	06/297,226	8/23/83
4,399,758	06/245,376	8/23/83
4,399,764	06/280,607	8/23/83
4,399,769	06/268,903	8/23/83
4,399,782	06/303,967	8/23/83
4,399,800	06/376,121	8/23/83
4,399,805	06/278,848	8/23/83
4,399,807	06/271,955	8/23/83
4,399,808	06/288,968	8/23/83
4,399,814	06/258,073	8/23/83
4,399,816	06/343,538	8/23/83
4,399,822	06/227,479	8/23/83
4,399,829	06/251,367	8/23/83
4,399,835	06/336,184	8/23/83
4,399,837	06/287,027	8/23/83
4,399,840	06/371,928	8/23/83
4,399,845	06/266,009	8/23/83
4,399,847	06/366,719	8/23/83
4,399,851	06/255,245	8/23/83
4,399,855	06/346,177	8/23/83
4,399,856	06/296,974	8/23/83
4,399,858	06/240,613	8/23/83
4,399,869	06/437,119	8/23/83
4,399,871	06/331,251	8/23/83
4,399,876	06/293,422	8/23/83
4,399,891	06/357,046	8/23/83
4,399,893	06/316,083	8/23/83
4,399,903	06/330,951	8/23/83
4,399,910	06/328,722	8/23/83
4,399,914	06/369,091	8/23/83
4,399,923	06/308,141	8/23/83
4,399,931	06/247,102	8/23/83
4,399,934	06/271,548	8/23/83
4,399,939	06/338,472	8/23/83
4,399,940	06/371,065	8/23/83
4,399,946	06/225,245	8/23/83
4,399,949	06/219,553	8/23/83
4,399,959	06/315,120	8/23/83
4,399,961	06/257,687	8/23/83
4,399,973	06/407,333	8/23/83
4,399,975	06/224,008	8/23/83
4,399,977	06/340,209	8/23/83
4,399,983	06/240,839	8/23/83
4,399,989	06/263,107	8/23/83
4,400,013	06/274,770	8/23/83
4,400,023	06/283,621	8/23/83
4,400,030	06/286,439	8/23/83
4,400,031	06/243,046	8/23/83
4,400,036	06/279,391	8/23/83
4,400,043	06/261,370	8/23/83
4,400,045	06/232,419	8/23/83
4,400,056	06/244,682	8/23/83
4,400,068	06/369,830	8/23/83
4,400,084	06/328,071	8/23/83
4,400,093	06/394,061	8/23/83
4,400,096	06/269,263	8/23/83

Patent Number	Serial Number	Issue Date
4,400,097	06/265,711	8/23/83
4,400,105	06/311,948	8/23/83
4,400,108	06/334,969	8/23/83
4,400,114	06/345,455	8/23/83
4,400,115	06/379,144	8/23/83
4,400,121	06/228,377	8/23/83
4,400,132	06/275,795	8/23/83
4,400,134	06/234,752	8/23/83
4,400,138	06/312,522	8/23/83
4,400,141	06/276,261	8/23/83
4,400,146	06/235,132	8/23/83
4,400,147	06/247,610	8/23/83
4,400,157	06/377,668	8/23/83
4,400,161	06/341,251	8/23/83
4,400,188	06/315,683	8/23/83
4,400,192	06/329,363	8/23/83
4,400,201	06/329,260	8/23/83
4,400,205	06/340,166	8/23/83
4,400,212	06/340,481	8/23/83
4,400,218	06/355,156	8/23/83
4,400,230	06/323,994	8/23/83
4,400,240	06/324,092	8/23/83
4,400,243	06/396,283	8/23/83
4,400,248	06/355,506	8/23/83
4,400,256	06/332,263	8/23/83
4,400,268	06/360,640	8/23/83
4,400,270	06/319,184	8/23/83
4,400,290	06/396,289	8/23/83
4,400,292	06/359,229	8/23/83
4,400,296	06/274,962	8/23/83
4,400,311	06/343,580	8/23/83
4,400,316	06/320,699	8/23/83
4,400,333	06/327,179	8/23/83
4,400,335	06/331,006	8/23/83
4,400,350	06/427,283	8/23/83
4,400,357	06/294,363	8/23/83
4,400,360	06/445,824	8/23/83
4,400,381	06/288,836	8/23/83
4,400,390	06/318,429	8/23/83
4,400,399	06/286,543	8/23/83
4,400,415	06/292,580	8/23/83
4,400,439	06/232,491	8/23/83
4,400,466	06/312,165	8/23/83
4,400,523	06/319,768	8/23/83
4,400,531	06/290,907	8/23/83
4,400,533	06/346,824	8/23/83
4,400,538	06/272,629	8/23/83
4,400,542	06/256,295	8/23/83
4,400,544	06/341,758	8/23/83
4,400,550	06/348,501	8/23/83
4,400,551	06/294,293	8/23/83
4,400,557	06/263,770	8/23/83
4,400,562	06/279,645	8/23/83
4,400,589	06/283,116	8/23/83
4,400,592	06/291,553	8/23/83
4,400,608	06/321,105	8/23/83
4,400,617	06/320,096	8/23/83
4,400,628	06/349,330	8/23/83
4,400,629	06/394,632	8/23/83
4,400,635	06/227,147	8/23/83
4,400,672	06/296,981	8/23/83
4,400,692	06/320,675	8/23/83
4,400,696	06/258,781	8/23/83
4,400,698	06/336,198	8/23/83
4,400,702	06/253,195	8/23/83
4,400,721	06/282,400	8/23/83
4,400,728	06/237,689	8/23/83
4,400,754	06/325,563	8/23/83
4,400,763	06/319,118	8/23/83
4,400,765	06/235,695	8/23/83
4,400,766	06/222,465	8/23/83
4,400,804	06/301,488	8/23/83
4,400,806	06/363,391	8/23/83

Notification of Acceptance of Delayed Payment of Maintenance Fee (35 U.S.C. 41(c); 37 CFR 1.378)

The patent listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenace fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,393,546	06/303,401	7/19/83	9/18/81	10/14/87

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,494,220, Re. S.N. 004,393, Filed Jan. 15, 1987, Cl. 365/200, FOLDED BIT LINE MEMORY WITH ONE DECODER PER PAIR OF SPARE ROWS, Austin C. Dumbri, et al., Owner of Record: *Bell Telephone Laboratories, Murray Hill, N.J.,* Attorney or Agent: Peter V. D. Wilde, et al., Ex. Gp.: 233

4,554,433, Re. S.N. 098,051, Filed Sept. 17, 1987, Cl. 219/137.63, WELDING CONDUIT STOP, David L. Toothaker, Owner of Record: *Tweco Products, Inc., Wichita, Kans.,* Attorney or Agent: Gerald P. Parsons, et al., Ex. Gp.: 216

4,600,636, Re. S.N. 098,052, Filed Sept. 17, 1987, Cl. 428/304.4, CORE MATERIAL FOR AN AUTOMOBILE BUMPER, Shokei Yoshimura, et al., Owner of Record: *Japan Styrene Paper Corp., Tokyo, Japan,* Attorney or Agent: Donald W. Banner, et al., Ex. Gp.: 154

4,604,435, Re. S.N. 095,970, Filed Sept. 14, 1987, Cl. 525/476, THERMOSETTING EPOXY RESIN COMPOSITIONS, Taro Koshii, et al., Owner of Record: *Toray Silicone Co., Ltd., Tokyo, Japan,* Attorney or Agent: Robert L. McKellar, Ex. Gp.: 151

4,608,294, Re. S.N. 096,642, Filed Sept. 11, 1987, Cl. 428/141, PROCESS FOR OBTAINING AREAS OF DISTINCTIVE APPEARANCE ON SYNTHETIC COVERINGS AND PRODUCT DERIVED THEREFROM, Jean-Francois Courtoy, et al., Owner of Record: *Eurofloor, S.A., Wiltz, Luxembourg,* Attorney or Agent: David S. Fishman, et al., Ex. Gp.: 158

4,611,081, Re. S.N. 098,171, Filed Sept. 18, 1987, Cl. 560/53, PROCESS FOR THE PREPARATION OF HMG-COA REDUCTASE INHIBITORS INTERMEDIATES, Joseph E. Lynch, et al., Owner of Record:

Merck & Co., Inc., Rahway, N.J., Attorney or Agent: Mario A. Monaco, et al., Ex. Gp.: 126

4,617,222, Re. S.N. 096,348, Filed Sept. 11, 1987, Cl. 428/142, PROCESS FOR OBTAINING AREAS OF DISTINCTIVE APPEARANCE ON SYNTHETIC COVERINGS AND THE PRODUCT DERIVED THEREFROM, Jean-Francois Courtoy, et al., Owner of Record: *Eurofloor, S.A., Wiltz, Luxembourg*, Attorney or Agent: David S. Fishman, et al., Ex. Gp.: 158

4,625,947, Re. S.N. 099,165, Filed Sept. 17, 1987, Cl. 254/323, TIRE LIFT/CARRIER, Stephen A. Denman, et al., Owner of Record: *Dever Manufacturing, Inc., Dayton, Ohio*, Attorney or Agent: William R. Jacox, et al., Ex. Gp.: 245

4,639,111, Re. S.N. 099,436, Filed Sept. 21, 1987, Cl. 354/481, PSEUDO FORMAT CAMERA WITH EXPOSURE CONTROL, Donald M. Harvey, Owner of Record: *Eastman Kodak Co., Rochester, N.Y.*, Attorney or Agent: Roger A. Fields, et al., Ex. Gp.: 211

4,644,605, Re. S.N. 096,349, Filed Sept. 11, 1987, Cl. 15/329, STICK VACUUM CLEANER, Michael S. Jose, et al., Owner of Record: *Bissell, Inc., Grand Rapids, Mich.*, Attorney or Agent: Peter P. Price, et al., Ex. Gp.: 242

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,860,003, Reexam. No. 90/001,349, Requested: Oct. 13, 1987, Cl. 128/287, CONTRACTABLE SIDE PORTIONS FOR DISPOSABLE DIAPER, Kenneth B. Buell, Owner of Record: *The Procter & Gamble Co., Cincinnati, Ohio*, Attorney or Agent: Frederick H. Braun, Ex. Gp.: 330, Requester: Dressler, Goldsmith, et al., Chicago, Ill.

4,516,885, Reexam. No. 90/001,347, Requested: Oct. 8, 1987, Cl. 405/261, METHOD AND APPARATUS FOR COMBINING RESIN BONDING AND MECHANICAL ANCHORING OF A BOLT IN A ROCK FORMATION, Frank Calandra, Jr., Owner of Record: *Jenmar Corp., Pittsburgh, Pa.*, Attorney or Agent: Price & Adams, Ex. Gp.: 350, Requester: Birmingham Steel Corp., Birmingham, Ala.

4,518,292, Reexam. No. 90/001,348, Requested: Oct. 8, 1987, Cl. 411/82, METHOD AND APPARATUS FOR COMBINING RESIN BONDING AND MECHANICAL ANCHORING OF A BOLT IN A ROCK FORMATION, Frank Calandra, Jr., Owner of Record: *Jenmar Corp., Pittsburgh, Pa.*, Attorney or Agent: Price & Adams, Ex. Gp.: 350, Requester: Birmingham Steel Corp., Birmingham, Ala.

4,662,875, Reexam. No. 90/001,346, Requested: Oct. 8, 1987, Cl. 604/389, ABSORBENT ARTICLE, Dennis O. Hirotsu, et al., Owner of Record: *The Procter & Gamble Co., Cincinnati, Ohio*, Attorney or Agent: Leonard W. Lewis, Ex. Gp.: 330, Requester: Dressler, Goldsmith, et al., Chicago, Ill.

Patent Terms Extended Under 35 USC 156

Certificates extending the terms with respect to the following patents were issued under the provisions of 35 USC 156 on Oct. 1, 1987.

Patent No. 4,146,719, granted Mar. 27, 1979, to Tsutomu Irikura, Owner of Record: Kyorin Seiyaku Kabushiki Kaisha, Title: Piperazinyl Derivatives of Quinoline Carboxylic Acids, Classification: 544–363, Term Extended: 2 years

Patent No. 4,182,763, granted Jan. 8, 1980, to George P. Casten, et al., Owner of Record: Mead Johnson & Co., Title: Buspirone Anti-Anxiety Method, Classification: 514–252, Term Extended: 2 years

Patent No. 4,215,215, granted July 29, 1980, to Werner Bollag, et al., Owner of Record: Hoffmann-La Roche, Inc., Title: 9-Phenyl-Nonate Traene Compounds, Classification: 544–176, Term Extended: 2 years

Patent No. 4,283,408, granted Aug. 11, 1981, to Yasufumi Hirata, et al., Owner of Record: Yamanouchi Pharmaceutical Co., Ltd., Title: Guanidino Thiazole Compounds, Process for Preparation and Gastric Inhibiting Compositions Containing Them, Classification: 514–370, Term Extended: 2 years

Patent No. 4,328,592, granted May 11, 1982, to Jerome J. Klawitter, Owner of Record: Hemex, Inc., Title: Heart Valve Prosthesis, Classification: 623–2, Term Extended: 476 days

Patent No. 4,361,549, granted Nov. 30, 1982, to Patrick C. Kung, et al., Owner of Record: Ortho Pharmaceutical Corp., Title: Complement-Fixing Monoclonal Antibody to Human T Cells, and Method of Preparing Same, Classification: 530–387, Term Extended: 201 days

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Patents Available for License or Sale

4,459,506. INCANDESCENT ILLUMINATING DEVICE WITH ANTIFRAGILITY COATING, *Kent S. Wilson, Esq.*, at Premier Industrial Corp., 4415 Euclid Ave., Cleveland, Ohio 44103.

4,609,901. CLAMP-DOWN BRACKET FOR HIGH-VOLTAGE POWER TRANSFORMER, *Joseph M. Hamm*, 24901 W. North Rd., Lake Villa, Ill. 60046.

4,622,833. VEHICLE WHEEL LOCK, *Richard L. Shepherd*, 2517 Pansy Ln., Pasadena, Tex. 77503.

4,629,187. HAND-HELD PLASTIC GUIDE FOR A POOL STICK, *William A. Mirowski*, 24941 Forest Dr., Lake Villa, Ill. 60046.

4,660,338. SEALING ELEMENT FOR COMPONENTS OF BUILDINGS, *Atlas IdealWaldner/Torefabrik*, Kapuzinerstrabe 84e, A–4020 Linz, Austria.

4,686,878. NEW ORLEANS WINDCHIMES, *Barbara A. Herbert*, 812 Cameron Ct., Kenner, La. 70065.

SN/07/085,954. HEEL PROTECTOR SHOE GUARD COVER, *Regeana E. Ballard*, 3024 Batavia St., Nashville, Tenn. 37209.

PATENT NOTICES

Certificates of Correction for the Week of Nov. 10, 1987

Re. 32,285	4,640,865	4,663,382	4,674,419
D. 289,760	4,642,038	4,663,498	4,674,690
4,160,335	4,643,051	4,663,573	4,674,993
4,405,427	4,644,038	4,663,858	4,674,999
4,494,209	4,645,894	4,664,393	4,675,051
4,505,843	4,646,666	4,664,565	4,675,169
4,523,030	4,648,958	4,664,918	4,675,219
4,530,752	4,650,864	4,665,247	4,675,245
4,534,148	4,651,179	4,665,279	4,675,307
4,536,154	4,652,627	4,665,354	4,675,710
4,540,483	4,652,968	4,665,965	4,675,713
4,555,542	4,654,042	4,665,988	4,675,842
4,558,042	4,654,776	4,666,318	4,676,006
4,560,604	4,655,287	4,666,962	4,676,205
4,561,793	4,655,739	4,667,000	4,676,257
4,565,621	4,655,744	4,667,285	4,676,397
4,566,326	4,655,754	4,667,296	4,676,501
4,574,898	4,656,068	4,668,052	4,676,650
4,579,414	4,656,965	4,668,429	4,677,034
4,581,619	4,656,970	4,668,830	4,677,062
4,587,626	4,657,222	4,669,417	4,677,193
4,588,609	4,657,598	4,669,530	4,677,228
4,601,806	4,657,632	4,669,792	4,677,274
4,604,366	4,658,054	4,670,222	4,677,415
4,605,719	4,658,312	4,670,334	4,677,477
4,608,554	4,658,559	4,670,367	4,678,831
4,609,670	4,658,690	4,670,591	4,679,152
4,613,569	4,658,873	4,670,634	4,679,421
4,615,606	4,659,422	4,671,073	4,679,534
4,615,791	4,659,554	4,671,509	4,679,607
4,617,385	4,659,705	4,671,850	4,680,098
4,622,096	4,660,145	4,671,982	4,680,237
4,623,997	4,660,431	4,672,088	4,680,408
4,629,372	4,660,477	4,672,171	4,680,795
4,629,458	4,660,653	4,672,393	4,681,020
4,631,183	4,660,974	4,672,810	4,681,037
4,632,294	4,661,206	4,672,974	4,681,435
4,633,449	4,661,615	4,673,128	4,681,696
4,634,822	4,662,067	4,673,155	4,681,793
4,635,670	4,662,129	4,673,332	4,682,061
4,635,825	4,662,365	4,673,409	4,683,317
4,635,985	4,662,613	4,673,628	4,685,255
4,638,383	4,662,759	4,673,631	4,689,559
4,639,968	4,662,970	4,673,756	
4,640,361	4,662,992	4,674,001	

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	San Diego Public Library	(619) 236-5813
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New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
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	Buffalo and Erie County Public Library	(716) 846-7101
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North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF October 10, 1987

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	8-05-86
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-85
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	1-27-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-29-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	2-18-86
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	10-14-85
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	1-07-85
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-21-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	9-06-85
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	2-20-86
DESIGN, GROUP 290—K. L. CAGE, Director	1-18-85
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	9-12-86
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	10-04-85
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-15-85
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	12-29-86
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-02-87

Expiration of patents: The patents within the range of numbers indicated below expire during October 1987, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,531,806 to 3,537,106, inclusive

Plant Patents ..... Numbers 2,991 to 2,995 inclusive

REEXAMINATIONS

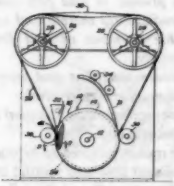
NOVEMBER 10, 1987

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,682,234 (780th)
STRUCTURE FOR THE CONTINUOUS CASTING OF METAL BARS

Ralph A. Vogel, Three Rivers, Mich., assignor to Essex International, Inc.

Reexamination Request No. 90/000,874, Oct. 4, 1985.
Reexamination Certificate for Patent No. 3,682,234, issued Aug. 8, 1972, Ser. No. 73,376, Sep. 17, 1970.
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—433



AS A RESULT OF REEXAMINATION IT HAS BEEN DETERMINED THAT:

Claims 1–8 are cancelled.

[1. A structure for the continuous casting of metal bars from hot molten metal, said structure comprising, in combination, a rotatable casting wheel having a continuous peripheral groove with a continuous outer circumferential opening, and a continuous belt defining a continuous one-sided strip for closing at least a circumferential portion of said circumferential opening for its entire width so as to define a chamber for receiving said molten metal and for forming a continuous metal bar as said molten metal drops below its melting point, substantially all of said belt being in contact with said molten metal and said metal bar.]

B1 4,048,654 (781st)
STEREOPHONIC TELEVISION SOUND TRANSMISSION SYSTEM

Carl R. Wegner, La Grange, Ill., assignor to Telesonics, Inc., Chicago, Ill.

Reexamination Request Nos. 90/001,040, Jun. 20, 1986 and 90/001,081, Sep. 10, 1986 and 90/001,129, Nov. 6, 1986.
Reexamination Certificate for Patent No. 4,048,654, issued Sep. 13, 1977, Ser. No. 659,101, Feb. 18, 1986.
Int. Cl.[4] H04N *7/00*
U.S. Cl. 358—144

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–2, 16–36, 39 and 42–59 is confirmed.

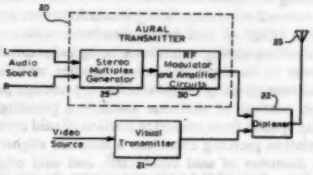
Claims 13, 37 and 40 are determined to be patentable as amended.

Claims 14, 15, 38 and 41 dependent on an amended claim, are determined to be patentable.

New claims 60–109 are added and determined to be patentable.

1. A stereophonic sound transmission system for transmitting within a television broadcast channel having defined frequency limits left and right audio source signals and a video source signal each having a predetermined upper frequency limit, said video source signal being amplitude-modulated on a video carrier to form an AM signal occupying a first portion of said channel, said system comprising, in combination:

generator means including a stereo multiplex generator for generating a composite signal including a first component representative of the sum of said left and right source signals, a second amplitude-modulated subcarrier compo-



nent representative of the difference between said left and right signals, said subcarrier component having upper and lower sidebands centered about a suppressed subcarrier, and a pilot component having a frequency one-half the frequency of said suppressed subcarrier;

transmitter means including means for generating a sound carrier within said broadcast channel, and means for frequency-modulating said sound carrier with said composite signal to form an FM signal occupying a second portion of said channel;

receiver means for receiving said television broadcast channel including means for deriving said composite signal; and

demodulator means for developing said left and right audio source signals from said composite signal.

B1 4,385,794 (782nd)
INSULATION DISPLACEMENT TERMINAL

John E. Lucius, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Reexamination Request No. 90/000,767, Apr. 26, 1985.
Reexamination Certificate for Patent No. 4,385,794, issued May 31, 1983, Ser. No. 351,725, Feb. 24, 1982.
Continuation of Ser. No. 927,720, Jul. 25, 1978, abandoned.
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—399

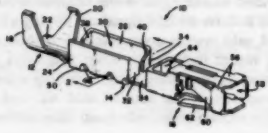
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–10 is confirmed.

1. An electrical terminal for effecting insulation displacing termination of an electrical wire formed by a conductor covered with insulation, said terminal comprising:

a forward mating portion having a profile adapted to engage another electrical terminal;

a rearward wire engaging portion integral with said forward mating portion, said rearward wire engaging portion comprising an elongate base portion and first and second elongate beam members connected to opposite sides of said base by respective bights, said beam members being substantially parallel and spaced apart a distance slightly greater than the diameter of said wire to define a wire receiving channel therebetween, at least one indent means formed in each said beam member through said bight and into the adjacent base portion to extend into said wire receiving channel to increase the rigidity of said wire engaging portion;



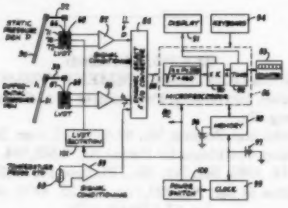
each of said beam members having at least one insulation piercing extension directed into said wire receiving channel toward a corresponding insulation piercing extension of the other of said beam members, with each of said insulation piercing extensions being substantially perpendicular to its respective beam member, and each of said insulation piercing extensions having an edge portion; said edge portion of said one insulation piercing extension being spaced from said edge portion of said corresponding insulation piercing extension a distance slightly less than the diameter of said conductor, and said edge portions piercing through said insulation of said wire to establish electrical and mechanical engagement therewith as said wire is moved laterally of its axis between said beam members and into said wire receiving channel.

B1 4,414,634 (783rd)

FLUID FLOW TOTALIZER

Timothy R. Louis, Berea; Carl A. Gedeon, Middleburg Heights; Maw H. Lee, Broadview Heights, and Eugene V. Erjavec, Willowick, all of Ohio, assignors to The Scott & Fetzer Company, Cleveland, Ohio

Reexamination Request No. 90/000,955, Feb. 10, 1986.
Reexamination Certificate for Patent No. 4,414,634, issued Nov. 8, 1983, Ser. No. 284,526, Jul. 17, 1981.
Int. Cl.[4] **G06F** *15/32;* **G01F** *1/00*
U.S. Cl. 364—510



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2, 4, 7, 8, 12, 19** and **20** are cancelled.

Claims **1, 3, 5, 9, 11, 13, 14** and **16** are determined to be patentable as amended.

Claims **6, 10, 15, 17** and **18**, dependent on an amended claim, are determined to be patentable.

1. A data totalizer for use with a fluid flow chart recorder, said chart recorder having a movable chart and a first marker to record thereon a first fluid pressure signal and a second marker to record thereon a second signal responsive to the fluid flow, and first and second motors to move the first and second markers, respectively, said data totalizer comprising, in combination:

a first and a second linear variable displacement transformer each having an electrical output and a linearly displaceable element to vary the output;

first and second connecting means connected to said first and second linearly displaceable transformer elements and adapted to be connected to the first and second motors, respectively; **[**and**]**

first and second arcuately movable shafts carrying said first and second markers and movable by said first and second motors, respectively;

said first and second connecting means including first and second arms adapted to be attached to said first and second shafts, respectively;

first and second links pivoted to said first and second arms approximately perpendicularly thereto and extending to the respective displaceable elements of said first and second transformers, respectively;

adjustable linkage between said first and second motors and said first and second markers, respectively;

said first and second connecting means adapted to be connected to said adjustable linkage; and

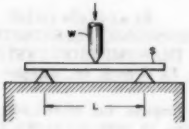
electronic calculating means *adapted to be* connected to the electrical outputs of said first and second transformers to utilize the fluid static pressure and fluid flow signals generated by the outputs of the first and second transformers, respectively, to calculate fluid flow rate.

B1 4,451,524 (784th)

POLYPROPYLENE STRAP AND METHOD OF MANUFACTURING THE SAME

Hiroyuki Matsumoto, Tokyo, Japan, assignor to Tsukasa Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Reexamination Request No. 90/001,041, Jun. 23, 1986.
Reexamination Certificate for Patent No. 4,451,524, issued May 29, 1984, Ser. No. 500,382, Jun. 2, 1983.
Claims priority, application Japan, Jan. 14, 1983, 58-3305
Int. Cl.[4] **B32B** *7/02, 9/00;* **D01D** *5/12*
U.S. Cl. 428—213



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **1** is determined to be patentable as amended.

Claim **2**, dependent on an amended claim, is determined to be patentable.

1. A polypropylene strap consisting of a single polypropylene sheet in which both surface layers are stretched at a low draw ratio of **[**1.2–3**]** *2* and an inner portion is stretched at a **[**high**]** draw ration of **[**10–18**]** *14*, wherein said strap has a tensile strength of **[**between about 49 kg/mm^2 and**]** about 51 kg/mm^2.

REISSUES

NOVEMBER 10, 1987

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,538

HEAD FOR HANDLING ELECTRICAL COMPONENTS

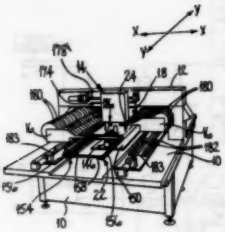
Victor T. Hawkswell, Witham, England, assignor to USM Corporation, Farmington, Conn.

Original No. 4,624,050, dated Nov. 25, 1986, Ser. No. 776,972, Sep. 12, 1985. Application for reissue Feb. 5, 1987, Ser. No. 11,557

Claims priority, application United Kingdom, Jan. 23, 1984, 84/00015

Int. Cl.[4] B65G *47/91*; H05K *13/02*

U.S. Cl. 29—740 **23 Claims**



1. A head for handling electrical components comprising a tool holder, means for moving the holder between a plurality of datum positions and further positions remote therefrom, the holder having means for interchangeably mounting a tool with a datum face thereof positioned at a predetermined position relative to the tool holder, the head further comprising a plurality of orienting jaws mounted for movement towards and away from a component carried by and abutting the datum face of a tool mounted on the tool holder when the holder is in one of the datum positions whereby to engage and orient a component carried by the tool, the jaws having a plurality of spaced sets of cooperating datum faces generally transverse to the plane of the datum face of a tool in the holder, each set of datum faces of the jaws being so disposed as to be capable of orienting a component carried by a tool mounted on the tool holder when the holder is at a corresponding one of said datum positions.

Re. 32,539

SKYLIGHT CONSTRUCTION

Arthur P. Jentoft, Kennebunkport, and Paul A. Couture, Emery Mills, both of Me., assignors to Wasco Products, Inc., Sanford, Me.

Original No. 4,439,962, dated Apr. 3, 1984, Ser. No. 175,306, Aug. 4, 1980. Continuation-in-part of Ser. No. 923,245, Jul. 10, 1978, abandoned. Application for reissue Apr. 1, 1986, Ser. No. 846,710

Int. Cl.[4] E04B *7/18*

U.S. Cl. 52—200 **18 Claims**

16. A skylight construction for an opening in a building comprising:

a curb frame extending about the opening and having means for securing the frame in a fixed position about the opening, said curb frame being of heat conductive material and having an inner section and an outer section,

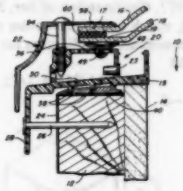
transparent or translucent means covering the opening and extending at its edges to the curb frame,

means over the frame for retaining the covering means to the curb frame,

gasket means carried by said curb frame,

means for securing said retaining means to said curb frame to sandwich said transparent or translucent means between a portion of said retaining means and said gasket means, and

a low heat conductive plastic bridge disposed between said outer section and said inner section of said curb frame for impeding heat transfer through the curb frame,



said curb frame inner section and said curb frame outer section including respective facing walls, each having interlocking surfaces adapted to hold said plastic bridge in a position adjacent said gasket means and underlying said transparent or translucent means,

said curb frame having means supporting said gasket means by and over one of said facing walls.

Re. 32,540

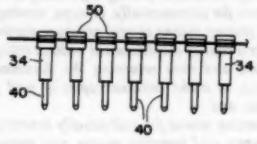
TERMINAL POSITIONING METHOD AND CONSTRUCTION

James V. Murphy, Warwick, R.I., assignor to Advanced Interconnections, Inc., West Warwick, R.I.

Original No. 4,442,938, dated Apr. 17, 1984, Ser. No. 477,622, Mar. 22, 1983. Application for reissue Mar. 17, 1986, Ser. No. 839,957

Int. Cl.[4] B65D *73/02*, *85/20*

U.S. Cl. 206—329 **20 Claims**



1. A construction for temporarily positioning a plurality of [socket] terminals on an electrical circuit board in a predetermined configuration prior to solder connection thereto, comprising a sheet of relatively thin, flexible, electrically insulative, resinous plastic material having a plurality of holes extending therethrough, said holes arranged in a planar configuration about said sheet to correspond with said predetermined positioning of said [socket] terminals in said circuit board, a plurality of [socket] terminals each having a pin adapted for insertion into an opening in said board at their lower end and an enlarged generally cylindrical head at their upper end, said enlarged head having upper and lower *head* sections defined by an inwardly extending [perimetal] *perimetrical* groove intermediate the height thereof and of a lateral extent less *than that of* said upper and lower sections, said holes of a [perimetal] *perimetrical* extent less than *that of* said head sections but generally corresponding to or slightly greater than that of said groove, said terminals adapted for positioning upon said sheet with the heads thereof extending through said holes and the sheet extending into said grooves and wherein the leading edge of at least one of said upper and lower head sections is

provided with a longitudinally oriented, sheet contacting surface to enable said terminals to be push positioned into said grooves.

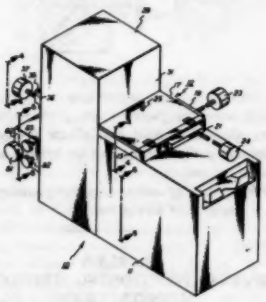
Re. 32,541
FLUIDIC FEEDING OF DOCUMENTS TO AN EXPOSURE STATION

Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Original No. 4,109,903, dated Aug. 29, 1978, Ser. No. 824,885, Aug. 15, 1977. Continuation of Ser. No. 053,864, Jul. 2, 1979, abandoned, which is a continuation of Ser. No. 649,371, Jan. 15, 1976, abandoned. Application for reissue Jul. 7, 1981, Ser. No. 281,145

Int. Cl.[4] B65H 5/22, 29/00

U.S. Cl. 271—3 26 Claims



2. Apparatus for storing and feeding documents to and from an exposure station for providing a reproduction system capable of providing simplex or duplex copies of the documents comprising:

(a) reproduction apparatus having an exposure station including a document exposure platen and liftable platen cover means for covering said platen;

(b) storage means for storing a plurality of documents;

(c) means for incrementally, in steps, moving documents out of said storage means to said exposure station at said platen to make a copy of the document without lifting said platen cover means, and then returning the document to said storage means, to make collated copies of said plurality of documents; and

(d) inverting means for individually inverting said documents;

(e) wherein said inverting means, said storage means and said means for moving documents provide for said document copying and inverting operations to be executed at about the same time, thereby expediting the production of duplex copies, and so that said inverted documents may be fed to said exposure station to provide duplex copies without lifting said platen cover means.

Re. 32,542
MOLDED PRODUCTS OF POLYPROPYLENE

Akinobu Shiga, Ichihara; Kiyoshi Matsuyama, Niihama; Masahiro Kakugo, Narashino; Yukio Naito, and Seiichiro Ima, both of Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Original No. 4,283,463, dated Aug. 11, 1981, Ser. No. 103,133, Dec. 13, 1979. Application for reissue Nov. 5, 1986, Ser. No. 927,219

Claims priority, application Japan, Dec. 13, 1978, 53-155973; Dec. 29, 1978, 53-165134

Int. Cl.[4] B32B 27/32; C08F 110/06

U.S. Cl. 428—512 21 Claims

1. A stretched film, for use in electrical insulation, prepared from a polypropylene having an isotactic pentad fraction of the boiling heptane insoluble portion of at least about 0.955 and a content of the boiling heptane soluble portion of about 2.0 to 9.0% by weight.

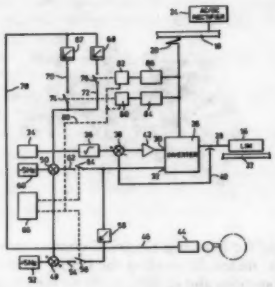
Re. 32,543
BRAKING CONTROL

Dennis F. Williamson, Kingston, Canada, assignor to Urban Transportation Development Corp., Ltd., Toronto, Canada

Original No. 4,405,886, dated Sep. 20, 1983, Ser. No. 238,076, Feb. 25, 1981. Application for reissue Jun. 20, 1986, Ser. No. 876,680

Int. Cl.[4] H02P 3/18

U.S. Cl. 318—376 9 Claims



1. A regenerative braking system comprising an electric induction motor, *said motor being operable in a motoring mode wherein said motor is conditioned to receive power from a source and a braking mode wherein said motor is conditioned to supply power to said source,* an external conductor connected to said motor to transfer power between said motor and a source, sensing means to sense the voltage in said external conductor, [and] control means to control the regenerative capacity of said motor, said control means being operable to increase the slip frequency between the synchronous frequency of said motor and the control frequency supplied to said motor to reduce said regenerative capacity upon said sensing means sensing a predetermined voltage in said conductor and thereby reduce the power delivered by said motor to the conductor *and inhibiting means to inhibit operation of said control means whilst said motor is in said motoring mode.*

Re. 32,544
SELECTIVE COLOR MODIFICATION

Nathaniel I. Korman, Albuquerque, N. Mex., assignor to Dubner Computer Systems, Inc., Paramus, N.J.

Original No. 4,525,736, dated Jun. 25, 1985, Ser. No. 417,345, Sep. 13, 1982. Application for reissue Jun. 30, 1986, Ser. No. 880,376

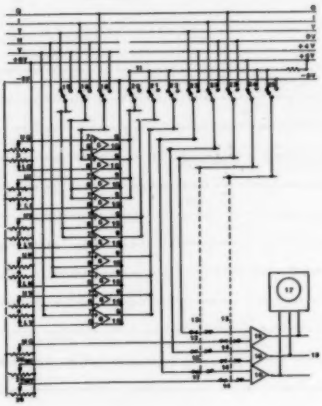
Int. Cl.[4] H04N 9/64

U.S. Cl. 358—28 20 Claims

15. A system for modifying the color representation of an object in a color picture comprising:

means for defining a region in a color space, the color space being defined by color coordinates and the region including the color representation of the object, the color representation

having color components with each color component being a value along the respective color coordinate; and



means for modifying the color representation of the object within the region to produce a new color representation for the object.

PATENTS

GRANTED NOV. 10, 1987

ERRATA

For CLASS	See PATENT NO.
437-040	4,704,783
437-041	4,704,784
437-110	4,704,785
437-032	4,704,786
081-451	4,704,929
220-400	4,705,085
239-585	4,705,210
073-863	4,705,249
361-091	4,705,322
239-125	4,705,330
439-387	4,705,331
439-069	4,705,332
439-071	4,705,333
439-210	4,705,334
439-133	4,705,335
439-597	4,705,336
439-595	4,705,337
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439-544	4,705,341
439-650	4,705,342
128-013	4,705,705
335-248	4,706,037
340-825	4,706,150

PATENTS

GRANTED NOV. 10, 1908

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PATENTS

GRANTED NOVEMBER 10, 1987

GENERAL AND MECHANICAL

4,704,742
WRITING SHIELD
Rudolph Foster, 527 Oak Street, Syracuse, N.Y. 13203
Filed May 5, 1986, Ser. No. 859,509
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—21 **1 Claim**

1. A pocket size writing shield for use by a writer to prevent soil inducing materials from being transferred from the hand of the writer onto a document, that includes a J-shaped member having an elongated leg for covering the heel of the writer's hand that is joined to a parallel shorter leg for covering the outer side of the writer's little finger when the hand is in a writing position, a ring mounted on the back of the shorter leg for engaging the little finger and holding the rigid member snuggly against the little finger and the heel of the hand, said member and said ring being formed of a single piece of non-porous plastic having a low coefficient of friction, the front surface of each leg being convex in form so that the rigid member slides easily over the document when it is being written upon.

4,704,743
GLOVE WITH REMOVABLE DIGITS
John S. Thornell, and Dennis P. Kleinman, both of 921 California Ave., San Jose, Calif. 95125
Filed Nov. 10, 1986, Ser. No. 929,531
Int. Cl.[4] A63D *5/00*
U.S. Cl. 2—159 **8 Claims**

1. A glove having removable digits comprising:
a base portion;
a hinge means;
an attachment means; and
a removable digit portion, said removable digit portion comprising at least two complete digit elements of a glove, including a thumb portion, said removable digit portion being attachable to said base portion by means of said attachment means, and said hinge means defining a first margin between a forehand portion of the glove and a backhand portion of the glove across a back of the thumb portion, said attachment means defining a second margin between the base portion and the digit portion along the forehand portion and the backhand portion through an interdigit notch of the glove, the attachment means terminating at the hinge means.

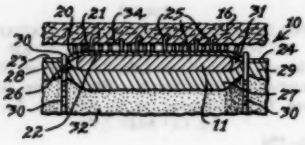
4,704,744
NECK AND FACE SHIELD ESPECIALLY ADAPTED TO BE WORN UNDER A HAIR DRYER
Janice L. Myers, 12523 Woods Lake Rd., Monroe, Wash. 98272
Continuation-in-part of Ser. No. 769,350, Aug. 26, 1985, abandoned. This application Jul. 14, 1986, Ser. No. 885,279
Int. Cl.[4] A42B *1/04*
U.S. Cl. 2—174 **4 Claims**

1. A face and neck shield especially adapted to be worn under a hood type hair dryer while the wearer's hair is being dried, said shield comprising:
(a) an annularly shaped, wide band having overlapping end portions rearwardly of the band, with means for detachably and adjustably securing the end portions together so that the the band snugle engages the head of the wearer substantially at the hair line of the wearer, and
(b) band support means including
(i) over-the-head strap means attached to the band at the front inboard edge of the band and adjustably attachable at the rear of the band, and
(ii) diverging over-the-head strap means spanning the forehead of the wearer and extending down to separated points of attachment to the band substantially at the outboard edge thereof, the angular relation of the points of attachment of the over-the-head strap means, considered on the basis of radii drawn from the center of the band, being with the first strap means arranged along a radius to the front and a radius to the rear of the band, and with the points of attachment of the diverging strap means to the band being arranged substantially along radii offset from the radius to the front of the band by angles of about 60°, and
the band support arrangement providing that the forward portion of the band between the diverging strap means connections thereto droops slightly under action of the heated air exhausting from the hair dryer deflecting most of the air exhausting from the dryer forwardly and away from the face and neck of the wearer.

4,704,745
GARMENT FASTENER ATTACHMENT FOR BRASSIERE STRAP
Phyllis E. Reaver, Rt. 1, 240; Lake Valley Road, Hendersonville, Tenn. 37075
Filed Feb. 9, 1987, Ser. No. 13,724
Int. Cl.[4] A41D *27/26*
U.S. Cl. 2—268 **9 Claims**

1. A fastener device for securing a longitudinal shoulder strap of a foundation garment to the fibrous undersurface of an overlying fabric outer garment worn by the wearer, comprising:

(a) an elongated fastener strip having a top surface and a bottom surface,
(b) said top surface comprising a plurality of miniature filament hook elements adapted to catch fibers in the undersurface of a fabric outer garment,
(c) securing means for holding said bottom surface longitudinally upon the top surface of a longitudinal shoulder strap of a foundation garment, so that said filament hook elements will catch the loose filaments in the undersurface of a fabric outergarment overlying said shoulder strap on the shoulder of the wearer of said foundation garment, and said outer garment to conceal said shoulder strap beneath said outer garment.

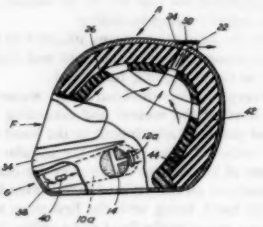


4,704,746

INTEGRAL HELMET

Pier L. Nava, Bergamo, Italy, assignor to Nava & C.S.P.A., Verderio Superiore, Italy

Filed Oct. 29, 1985, Ser. No. 792,469
Claims priority, application Italy, Nov. 22, 1984, 23693 A/84
Int. Cl.[4] A42B *3/00*
U.S. Cl. 2—424 **4 Claims**



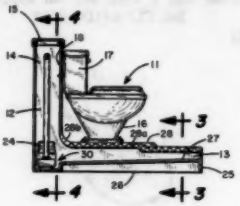
1. A helmet comprising:
an integral helmet (A) having a visor (F) on one front side;
a shock absorber liner (42) inside the helmet;
a comfort padding (44) inside the shock absorber liner;
an opening (34) for air inflow into the helmet through the one front side of the helmet;
at least one conduit opening (10*a*, 12*a*) at each side of the helmet lateral of the one, front side for ventilating air for the helmet;
at least one upper aperture (22) through a top of the helmet for discharging air from the helmet, whereby, owing to the top position, to facilitate such air discharge when the helmet is not moving relative to the ambient air; and
covering means (30) covering the at least one upper aperture relative to the helmet for protecting the at least one upper aperture from weather, the covering means (30) also being shaped for discharging air from inside the helmet through the at least one upper aperture by suction through the rear of the covering means relative to the one front side of the helmet during forward motion of the helmet relative to the one front side thereof.

4,704,747

SELF-CONTAINED BATHROOM UNIT

Gardner G. Brubakken, 610 Stillwell Ave., and Mehdi Mohammadian, 1143 Cherry St., both of Oshkosh, Wis. 54901

Filed Jun. 13, 1986, Ser. No. 874,062
Int. Cl.[4] E03D *1/00*
U.S. Cl. 4—321 **4 Claims**



1. A self-contained bathroom unit, comprising
(a) a generally L-shaped enclosure having a hollowed interior, comprising a horizontal extension and a vertical extension, and an open top end in said vertical extension,
(b) a cover removably and sealably fitting over said open top end of said vertical extension;
(c) said horizontal extension having top side and bottom surfaces enclosing a reservoir area;
(d) said bottom surface of the horizontal extension having downwardly projecting support edges;
(e) the interior of said horizontal extension having said bottom surface inclined downwardly toward said vertical extension, said horizontal extension directing flow of waste by gravity to a collection sump formed at the interecting region of said horizontal and vertical extensions, said collection sump having a lower surface recessed below the lowest point of said horizontal extension bottom surface to promote the accumulation of waste material in said collection sump for subsequent removal of the waste material from said collection sump;
(f) a sewage pumping means located in said collection sump, said sewage pumping means having an actuating means lower than the lowest end of the bottom surface of the horizontal extension to actuate said pump when waste is present; and
(g) said top surface of said horizontal extension having a raised interior surface portion extending toward said vertical extension and including a curved radius at the juncture of said horizontal and vertical extensions, thereby providing a raised interior sewage gas collection region in said horizontal extension which opens into said vertical extension and facilitates the escape of sewage gases from entrapment within said horizontal extension,
(h) said raised interior surface portion creating a stepped exterior of said top surface, and a commode mounted on said stepped exterior above said raised interior surface portion.

4,704,748

WASHING DEVICE FOR PARTS OF HUMAN BODY

Hisanobu Takeda, Aichi, and Yasuhiro Aso, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

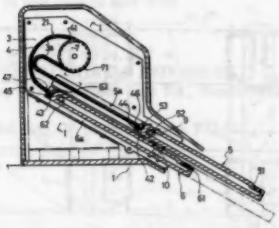
Filed Mar. 5, 1986, Ser. No. 836,660
Claims priority, application Japan, Mar. 29, 1985, 60-68011; Sep. 27, 1985, 60-215590
Int. Cl.[4] A61H *35/00*
U.S. Cl. 4—420.4 **11 Claims**

1. A washing device for parts of human body, comprising:
a housing to be mounted on a toilet bowl;
a supporting means disposed in said housing;

a first nozzle carrying means movably supported by said supporting means;

a second nozzle carrying means movably supported by said supporting means;

a drive means for selectively moving one of said first and second nozzle carrying means to or from an operative position where said nozzle carrying means extends into said bowl, said drive means including at least one drive motor; and



a pressurized water supply means for supplying pressurized water to either one of said first and second nozzle carrying means only after one of said nozzle carrying means is exactly located in the operative position; wherein:

said drive means comprises a rotatable member to be reversibly driven by said drive motor and a belt-like member one end of which is fixedly secured to said first nozzle carrying means and the other end of which is fixedly secured to said second nozzle carrying means, and

said belt-like member having its middle portion normally engaging the periphery of said rotatable member.

4,704,749

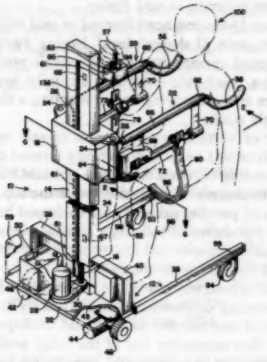
BODY LIFT AND WALKER FOR PARALYTICS

Benjamin A. Aubert, 4209 Bryce Dr., Anacortes, Wash. 98221

Filed May 23, 1986, Ser. No. 866,535

Int. Cl.[4] A61G 7/08

U.S. Cl. 5—81 B **9 Claims**



1. A body lift for a disabled person comprising:

a frame including a base and a plurality of wheels mounted on said base for permitting movement of said frame;

a first drive means mounted on said frame and operatively connected for imparting rotation to said wheels;

a vertical support extending upward from said base of said frame;

a pair of arm supports and a pair of leg supports movably mounted for translation along said vertical support; means for operatively connecting said leg supports to said arm support;

a second drive means mounted on said frame and connected to move said arm and leg support pairs along said vertical support;

said leg supports of said leg support pair being laterally pivotable toward and away from each other;

a biasing means connected to urge the leg supports to a normally outwardly pivoted position;

said arm supports of said arm support pair being coupled to pivot the leg supports inward laterally in a substantially orthogonal direction relative to said arm supports in response to weight applied by a user to the arm supports; and

a control means connected to said first and second drive means for controlling movement of said frame on its wheels and for adjusting the height of said arm and leg support pairs.

4,704,750

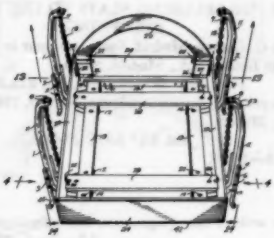
ASSEMBLEABLE, FREE-STANDING, BED SUSPENSION APPARATUS

Barry E. Wheelock, 2 White Birch Dr., Morris Plains, N.J. 07950

Filed Jul. 7, 1986, Ser. No. 883,305

Int. Cl.[4] A45F 3/22, 3/24

U.S. Cl. 5—127 **12 Claims**



1. An assembleable, free-standing, bed suspension apparatus for suspending a swinging bed frame therefrom, comprising:

a rectangularly-arranged support system including four assembleable, free-standing, upright stands, each of said upright stands comprising a vertical post portion, a lower horizontally-extending base portion integrally-connected to a lower end of said vertical post portion, and an upper horizontally-extending portion integrally-connected to an upper end of said vertical post portion;

a rectangularly-shaped bed frame including two longitudinally-extending side boards connected together by two transversely-extending end boards;

one of said four upright stands positioned at each end of said longitudinally-extending side boards at each corner of said bed frame, said upright stands being two sets of two upright stands positioned side-by-side, each set facing each other on both sides of said bed frame so as to form said rectangularly-arranged support system for said frame;

said bed frame being suspended from each of said upper portions of said upright stands by flexible means attached thereto, said upper portions extending horizontally inward over said bed frame as a means of providing clearance for the swinging motion of said bed frame when attached by said flexible means therewith;

said lower base portion of each of said upright stands comprising two legs extending horizontally in a V-shape along and in contact with a floor surface underneath said bed frame as a means for providing a stable base for said upright stands;

L-shaped stabilizing leg members being attached to and on opposite sides of said vertical post portions of each of said

upright stands, said stabilizing leg members comprising a vertical leg portion and an integrally-connected horizontal leg portion, said vertical leg portion being attached to said vertical post portion of said upright stand, and said horizontal leg portion extending along and in contact with said floor surface and being approximately perpendicular to said horizontal V-shaped legs of said upright stands;

first base connecting members extending longitudinally between and being attached at each end thereof to said lower horizontal base portions of each of said side-by-side upright stands as a means of providing stability thereto; and

second base connecting adjustable crossmembers extending transversely between and being means of providing unity and further stability to said rectangulary-arranged support system.

4,704,751

DEVICE FOR SECURING SLATS TO THE FRAME OF A BEDSPRING

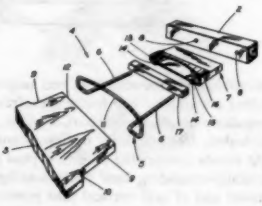
Fernando G. Guerra, Madrid, Spain, assignor to Fabricas Lucia, Antonio Betere, S.A., Madrid, Spain

Filed Jan. 29, 1986, Ser. No. 823,590

Claims priority, application Spain, Apr. 15, 1985, 286035; Apr. 15, 1985, 286036

Int. Cl.[4] A47C 23/06

U.S. Cl. 5—236 R 9 Claims



1. A bed slat securing device for securing slats to the frame of a bedspring, said slats acting as a support base for a mattress, said bedspring having a substantially rectangular frame, said frame being tubular in cross-section wherein a plurality of resilient arched slats are positioned parallel to one another and to the minor sides of the frame, ends of said slats secured to the frame by a securing device, said securing device comprised of a support, attached to each end of said slat, said slat support comprising a rod having a C-shaped section which partially encircles the slat and free end sections continuing in straight sections perpendicular to the C-shaped secton and parallel to the slat a ferrule, said ferrule which receive and guide receiving the end of the slat and having a bottom wall with arched grooves rod, the support rod said straight sections of the support protruding outwards therefrom through corresponding holes in the bottom wall, and a damper means, said damper means comprised of a piece housed in the bottom of said ferrule between the end of the slat and the bottom of the ferrule and on which said slat rests; the ends of the support rod being inserted in the frame tubular through holes provided in an inner wall thereof.

4,704,752

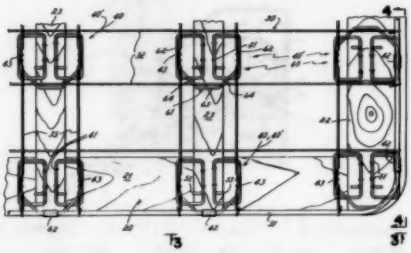
BOX SPRING ASSEMBLY WITH MODULAR TWIN CONTINUOUS SPRING ELEMENTS

Chester R. Yates, and Maurice M. Bruner, both of Carthage, Mo., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Feb. 28, 1986, Ser. No. 834,903

Int. Cl.[4] A47C 23/02, 23/04

U.S. Cl. 5—247 9 Claims



1. A box spring assembly having a rectangular horizontal frame, a rectangular wire grid parallel to and spaced above said frame, a plurality of wire spring elements each connected between said frame and said grid,

said wire grid comprising a rectangular border wire, a plurality of spaced, parallel, longitudinal wires, and a plurality of spaced, parallel, transverse wires, said longitudinal wires and said transverse wires extending between and being attached to opposite sides of said border wire, said longitudinal and transverse wires defining an array of rectangular pockets between adjacent pairs of said longitudinal wires and adjacent pairs of said transverse wires,

said spring elements being disposed between said frame and said grid for providing distributed elastic support to a bedding load on said grid, each of said spring elements occupying a single and separate pocket in said array,

each of said spring elements being integrally formed of a single and separate wire, and each including

a base formed on each end of said wire, each of said bases being fastened to said frame,

a planar U-shaped head formed in said wire between said ends, said U-shaped head having two parallel sides fastened to opposite sides of a single pocket in said grid and a third side extending between said two parallel sides and underlying and contacting a third side of said single pocket,

a pair of vertical arms on each of said spring elements, each of said vertical arms being formed of said wire and extending between said head and said base, each of said vertical arms being connected at the top directly to one of said parallel sides of said U-shaped head and including a plurality of bars angled to the vertical to yieldably resist the downward forces of the bedding load, each of said vertical arms comprising

a first connector bar being connected directly to and extending downwardly and inwardly from one end of one of said parallel sides of said U-shaped head toward the first connector bar of the other arm, said first connector bar of both of said arms being located in a common first vertical plane,

a second connector bar extending rearwardly away from a lower end of said first connector bar and away from said first vertical plane, said second connector bar of one arm being parallel to the second connector bar of the other arm,

a third connector bar extending downwardly and outwardly away from a lower end of said second bar, said third connector bar of both of said arms being located in

a second vertical plane, said second vertical plane being spaced from and parallel to said first vertical plane,

a fourth connector bar extending forwardly from said lower end of said third connector bar, said fourth connector bar extending from said second vertical plane toward said first vertical plane, said fourth connector bar of one of said arms being parallel to said fourth connecting bar of the other of said arms, and

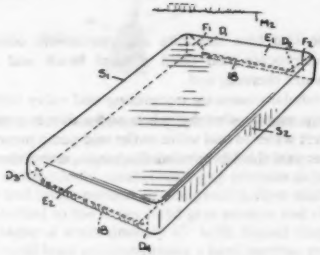
a fifth connector bar extending downwardly and inwardly from the forward end of said fourth connector bar to one end of one base of said wire.

4,704,753

FITTED CRIB OR BED SHEET

Audrey T. Lunt, 6371 Vermont Hill Rd., South Wales, N.Y. 14139

Filed Nov. 20, 1986, Ser. No. 932,612
Int. Cl.[4] A47G 9/00
U.S. Cl. 5—484 **5 Claims**



1. A fitted sheet for covering a standard crib or bed mattress, said sheet being created from a single blank having longitudinal and transverse fold lines which when the blank is folded in along these lines define sides and ends that are coextensive to those of the mattress, said blank having at its corners diagonal fold lines which when folded in form triangular folds that are ultrasonically sealed to the ends of the sheet to form reinforced right angle corners, said blank being formed of synthetic plastic flexible material having an absorbent to player laminated to a liquid-impermeable backing layer, whereby when an occupant of the crib or bed wets the sheet, the liquid is absorbed thereby, yet the underlying mattress is maintained in a dry state, each end being creased to form puckers, and an elastic strip ultrasonically joined to the puckers to render the end stretchable to cause the fitted sheet to conform snugly to the mattress.

4,704,754

TENSION ARCH STRUCTURE

Samuel G. Bonasso, 241 South High St., Morgantown, W. Va. 26505

Division of Ser. No. 783,567, Oct. 3, 1985, Pat. No. 4,644,978, which is a continuation-in-part of Ser. No. 568,219, Dec. 28, 1983, Pat. No. 4,631,772, which is a continuation-in-part of Ser. No. 372,805, Apr. 28, 1982, Pat. No. 4,464,803. This application Feb. 20, 1987, Ser. No. 16,795
Int. Cl.[4] E01D 11/00, 9/04
U.S. Cl. 14—20 **4 Claims**

1. A structure having end abutments for supporting a load across a span comprising in combination:

(a) a plurality of hollow compression tubes each having a length equal to said span;

(b) a deck overlaying and connecting said hollow compression tubes;

(c) said hollow compression tubes with their central axes parallel to the axis of the span;

(d) said hollow compression tubes underneath and abutting said deck;

(e) a plurality of vertical cable spacers each having a length equal to said hollow compression tubes;

(f) said vertical cable spacers with their central axes parallel to the central axis of the hollow compression tubes;

(g) said vertical cable spacers having a flat upper surface and a lower surface in a funicular curve with maximum depth in the center of the span;

(h) a plurality of tension elements each of a length exceeding the length of the hollow compression tubes;

(i) each of the tension elements positioned along the length of the lower surface of the vertical cable spacers to support said structure;

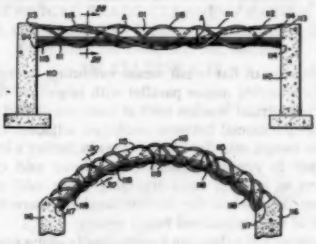
(j) said hollow compression tubes fitting in horizontal abutting relationship with the end abutments to transmit compressive forces; and,

(k) said tension elements attached to the end abutments to transmit tensile forces;

whereby the load over the span is transmitted to the end supports in part through the compressive forces of the compressive tubes and in part through the tensile force of the tension elements.

3. A structure having end abutments for supporting a load across a span comprising in combination:

(a) a plurality of hollow compression tubes having a total length equal to said span;



(b) a deck overlaying and connecting said hollow compression tubes;

(c) said hollow compression tubes with their central axes parallel to the axis of the span;

(d) said hollow compression tubes underneath and abutting said deck;

(e) each hollow compression tubes aligned end to end with the adjacent hollow compression tubes in a series;

(f) a plurality of tube tension elements each of a length exceeding the length of the series of hollow compression tubes;

(g) each of the tube tension elements wrapped helically around each hollow compression tube;

(h) said tube tension elements spaced around the circumference of each hollow compression tubes to hold adjacent hollow compression tubes in abutting relationship;

(i) said hollow compression tubes abutting the end abutments to transmit compressive forces; and

(j) said tension elements attached to the end abutments to transmit tensile forces;

whereby the load over the span is transmitted to the end supports in part through the compressive forces of the compressive tubes and in part through the tensile force of the tension elements.

4,704,755

APPARATUS FOR CLEANING EGGS

Jeffrey B. Kuhl, Kuhl Rd., P.O. Box 26, Flemington, N.J. 08822

Filed Apr. 3, 1986, Ser. No. 847,996
Int. Cl.[4] A01K 43/00
U.S. Cl. 15—3.13 **14 Claims**

1. An apparatus for cleaning eggs which comprises:

(a) a housing means;

(b) a conveying means movable longitudinally with respect to said housing means and adapted to transport eggs positioned thereon;

(c) a plurality of cylindrical brushes extending laterally across said conveying means and positioned immediately thereabove with the lowermost portions thereof in contact with eggs being carried upon said conveying means, said cylindrical brushes being movably mounted to allow lateral movement thereof across said conveying means as well as rotational movement thereof about the cylindrical axes thereof;

(d) a plurality of rod means each extending through the central axis of one of said cylindrical brushes, said cylindrical brushes being rotatably mounted upon said rod means;

(e) a camshaft means rotatably mounted longitudinally with respect to said housing means and including a plurality of cam lobes thereon with one of said cam lobes being positioned immediately adjacent to the end of each of said rod means for reciprocally driving said rod means and each cyclindrical brush associated therewith laterally with respect to said housing and said conveying means;

(f) a plurality of flat brush means extending laterally across said conveying means parallel with respect to the axes of said cylindrical brushes with at least one of said flat brush means positioned between each two adjacent cylindrical brush means, said flat brush means including a lower edge thereof in position immediately above said conveying means to contact eggs traveling upon said conveying means therebelow for further washing thereof between each of said cylindrical brush means;

(g) a control rod extending longitudinally along said conveying means adjacent to said housing means and being secured with respect to each of said flat brush means, said control rod being reciprocally longitudinally movable with respect to said housing means to cause longitudinal movement of said flat brush means with respect to the eggs traveling upon said conveying means to achieve flat brush scrubbing action between each cylindrical brush washing action; and

(h) a plurality of fluid conduits extending across said conveying means above said flat brush means, said fluid conduits defining spray outlets therealong to supply cleaning solution being carried within said fluid conduits downwar 'ly therebelow.

4,704,756

WATER-POWERED BACK SCRUBBER

Clarence O. Williams, Rocky Mount, and David C. Lanier, Holly Ridge, both of N.C., assignors to David C. Lanier, Holly Ridge, N.C.

Filed Dec. 18, 1986, Ser. No. 943,210

Int. Cl.[4] A46B *13/06*

U.S. Cl. 15—21 R **5 Claims**

1. In a shower apparatus having a water supply for dispensing shower water through a shower head, a shower brush assembly, comprising:

(a) a valve connected between a shower water supply and a shower head and being positionable to divert water from said shower water supply to a valve outlet;

(b) a support structure adapted to be mounted on a vertical wall of a shower stall or the like;

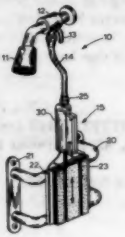
(c) a unitary shower brush assembly comprising:

(i) a base structure adapted to be loosely received and fixedly supported by said support structure;

(ii) first and second laterally-spaced vertical brushes loosely supported by said base structure in fixed positions thereon;

(iii) a third vertical brush mounted for reciprocation on said base structure between said first and second brushes; and

(iv) water-operated reciprocating pump means mounted



on said base structure and operatively connected to reciprocate said third vertical brush and discharge water thereon; and

(d) a tubular connector connecting said valve outlet to said pump means whereby when said valve is positioned to divert water to said valve outlet said pump means reciprocates said third brush and discharges water thereon.

4,704,757

ABRADING MATERIAL

David C. Young, 17 Barbers Wood Close, Ravenshead, Nottinghamshire, England

Filed Apr. 4, 1985, Ser. No. 719,805

Claims priority, application United Kingdom, Apr. 5, 1984, 8408838

Int. Cl.[4] B08B *1/00*

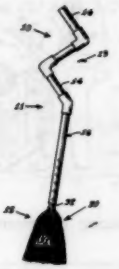
U.S. Cl. 15—104.94 **4 Claims**

1. An abrasive sheet material comprising a knitted ground structure formed of a heat shrinkable first material, said knitted ground structure having laid in floated threads of a second material in the form of projecting loops, said second material being harder than said first material and being less shrinkable than said ground structure material, said ground structure being shrunk from its as knitted state with said loops of said second material extending from the surface of said knitted ground structure in the form of abrading elements, and with said abrasive sheet material being folded to enclose a resilient core and defining a scouring pad, the surface of said sheet material from which said loops of said second material are raised forming an external surface of said scouring pad whereby in use of said scouring pad substantially only said second material makes contact with the work to be scoured with said shrunken ground structure serving as an anchor for said loops and as an enclosure for said resilient core.

4,704,758
HANDLE CONSTRUCTION FOR LONG HANDLED IMPLEMENTS

Charles W. Hoffman, 305 Hubbard Road, Lynnwood, Wash. 98036

Filed Jul. 28, 1986, Ser. No. 889,712
Int. Cl.[4] A46B 5/02
U.S. Cl. 15—144 B 3 Claims



1. An adjustable handle and implement head assembly comprising:

a handle unit comprising a handle member having a pair of offset and generally parallel hand grip portions defining an upper and lower portion an elongated hollow shaft member attached to the lower hand grip portion and disposed at an angle of approximately 45° with respect thereto;

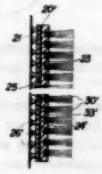
an implement head unit comprising a head member provided with an elongated narrow stem member that is dimensioned to be received within said hollow shaft member; and,

releasable securing means for selectively and adjustably securing the implement head unit to the handle unit.

4,704,759
BACK SCRUBBING DEVICE

Onello Mesa, 6646 N.W. 181 La., Miami, Fla. 33014

Filed Jan. 13, 1986, Ser. No. 818,454
Int. Cl.[4] A47K 7/02
U.S. Cl. 15—160 3 Claims



1. A back scrubbing device mountable on a vertical support wall surface and comprising:

(a) a backing plate having a substantially planar configuration and comprising at least a first plate segment and a second plate segment,

(b) said first and said second plate segments each comprsing a correspondingly positioned inner face fixedly secured together along a confronting surface and an outer exposed face disposed opposite to one another,

(c) said plate segments being commonly configured and dimensioned and said first plate segment being formed of a rubbery, substantially flexible material and said second plate segment being thicker than said first plate segment and formed from a hard, rigid material,

(d) a plurality of plastic material suction cups removably attachable to the supporting wall surface and secured on said exposed face of said first plate segment in spaced and immediately adjacent relation to one another and collectively disposed in an array over and extending outwardly from said exposed face of said first plate segment,

(e) a plurality of brush fingers each comprising a separate bundle of bristles secured to said second plate segment in spaced relation to one another and collectively covering substantially an entire exposed face of said second segment and extending outwardly therefrom in a direction opposite to an outward extension of said plurality of suction cups,

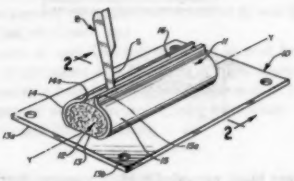
(f) said second plate segment being at least minimally displaceably and movable relative to the supporting wall surface due at least in part to inherent flexibility of said platic material of said suction cups and rubbery material of said first plate segment and said rigidity of said second plate segment, and

(g) said backing plate being removably securable to the support wall surface and slightly displaceable when secured thereto, whereby forces exerted on said back scrubbing device when coming into contact with a user's body, are at least partially absorbed by said slight displacement.

4,704,760
SURGICAL BLADE CLEANING DEVICE

Herman R. Grieshaber, 2044 Balmoral La., Glenview, Ill. 60025

Filed May 16, 1986, Ser. No. 864,069
Int. Cl.[4] B24B 3/54
U.S. Cl. 15—218.1 5 Claims



1. A device for use in cleaning a surgical blade soiled with adherent liquid an non-liquid matter comprising a hollow casing having an exposed surface provided with an elongated narrow slot sized to accommodate and guide the soiled blade portion when the latter is inserted at an acute angle through the slot and moved longitudinally thereof, and a frictional medium disposed within said casing having only a portion thereof aligned with said slot, being only accessible to the blade portion through said slot, and extending the full length of said slot; said medium resiliently engaging a concealed surface of the casing circumjacent the slot and being adapted to exert a compressive frictional force on the inserted soiled blade portion to effect cleaning thereof when the angularly disposed, soiled blade portion is moved longitudinally of said slot.

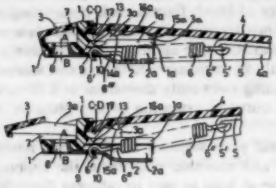
4,704,761
WIPER ARM WITH SLIDING CAP

Alan South, Willingham, and Alan Kenney, Over, both of England, assignors to Champion Spark Plug Europe S.A., Bische, Belgium

Filed Jul. 7, 1986, Ser. No. 882,484
Claims priority, application France, Jul. 10, 1985, 85 10565
Int. Cl.[4] B60S 1/04, 1/34
U.S. Cl. 15—250.19 12 Claims

1. A wiper arm, in particular for motor vehicles and having a longitudinal extent, said wiper arm comprising: a mounting head (1); a cap (3); a channel (4); articulation means for rotatably attaching the channel to the mounting head (1), said cap (3) having two extensions (3*a*, 3*b*) extending substantially parallel to the longitudinal extent of the wiper arm, beyond said

articulation means attaching the mounting head (1) and the channel (4); and means (14*a*, 15*a* and 14*b*, 15*b*) on the extensions (3*a*, 3*b*) for locking the channel (4) in at least two different positions with respect to the mounting head (1).



4,704,762

WIPER BLADE

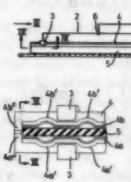
Christian Beneteau, Gorcy, France, and Norbert Guerard, Virton, Belgium, assignors to Champion Spark Plug Europe S.A., Binche, Belgium

Filed Aug. 4, 1986, Ser. No. 892,177

Claims priority, application France, Aug. 29, 1985, 85 12883

Int. Cl.[4] B60S *1/02*

U.S. Cl. 15—250.42 **6 Claims**



1. A wiper blade provided with a pressure distributing rod (4) having a lower portion, said pressure distributing rod (4) comprising at its lower portion two longitudinally extending lips (4*a*, 4*b*) directed towards a surface to be wiped (7) and between which extends a wiping element (5) for the wiper blade, the pressure distributing rod (4) being linked to a superstructure (1, 2) of the wiper blade by a plurality of claws (3) which are an integral part of said superstructure (1, 2), each said claw having spaced sides, characterized in that the pressure distributing rod (4) is retained on the superstructure (1, 2) of the wiper blade by deformations (4*a'*, 4*b'*; 14*a'*, 14*b'*) of said longitudinal lips (4*a*, 4*b*) provided on both sides of at least one of the claws (3) of the superstructure (1, 2) of the wiper blade.

4,704,763

WRINGER FOR MOPS AND THE LIKE

Dieter Sacks, Uerikon, and Hans Mönch, Küsnacht, both of Switzerland, assignors to Interpat Limited, London, England

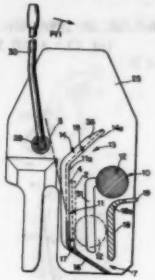
Filed Nov. 7, 1985, Ser. No. 796,015

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3440924

Int. Cl.[4] A47L *13/58*

U.S. Cl. 15—262 **48 Claims**

1. Apparatus for expelling moisture from mops and like implements wherein a carrier comprises a plate which supports a body of deformable absorbent material, comprising a support including means for locating the carrier of an implement in a predetermined position, said locating means comprising means for maintaining the carrier which occupies said position in a substantially vertical plane; wringing means movably carried by said support; and means for moving said wringing means along a predetermined path relative to the carrier in said position so that the wringing means is maintained in a substantially linear contact with and deforms successive increments of the body on such carrier during movement along at least one portion of said path.



4,704,764

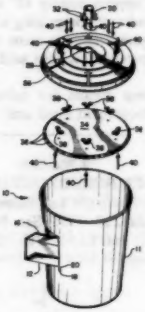
ASH DISPOSAL DEVICE

Rudy R. Metelko, Jr., 448 South 300 West, Price, Utah 84501

Filed Jul. 16, 1985, Ser. No. 755,934

Int. Cl.[4] F23J *1/00*

U.S. Cl. 15—301 **7 Claims**



1. An ash disposal apparatus comprising:

a generally cylindrical body having a base and an open upper end;

a lid configured so as to fit securely over the open upper end of the body, said lid having an opening disposed therein;

vacuum adaptor means defining an interior space, and being configured so as to securely cover the opening in the lid, and being capable of being placed in communication with a source of suction;

a frustoconical mesh filter disposed within the interior of the vacuum adaptor means, whereby said mesh filter filters out hot and cold particles which may flow into said vacuum adaptor means;

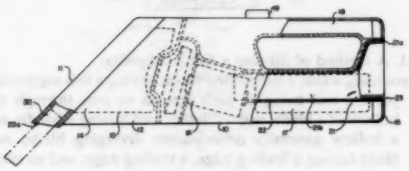
a door attached to the cylindrical body whereby access to the interior of the apparatus may be gained by opening said door and through which ash may be introduced into said container, said door being configured such that it forms a chute when opened;

a substantially planar and generally circular baffle disposed between the lid opening and the door such that air flowing between the open door and the lid opening must pass between the interior walls of the cylindrical body and the outside circumference of the baffle, such that an even airflow within the apparatus is achieved.

4,704,765
PORTABLE VACUUM CLEANER

Yasukazu Ataka, Ibaragi, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 703,898, Feb. 21, 1985, abandoned.
This application Feb. 24, 1987, Ser. No. 18,854
Claims priority, application Japan, Jun. 11, 1984, 59-87247[U]; Jun. 14, 1984, 59-89905[U]; Jun. 14, 1984, 59-89909[U]; Jun. 15, 1984, 59-89647[U]; Jun. 22, 1984, 59-94341[U]; Jul. 9, 1984, 59-104258[U]
Int. Cl.[4] A47L 5/24
U.S. Cl. 15—323 15 Claims

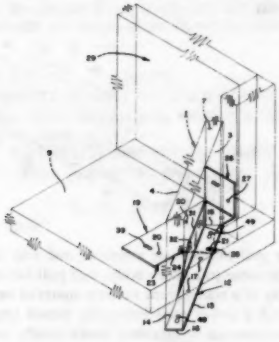


1. A portable vacuum cleaner comprising
a housing having a front end, a back end and a bottom surface, said front end being formed with a downward-facing suction inlet having an opening, the surface defining said opening being coplanar with said bottom surface,
a dust collecting means inside said housing,
a suction-generating means behind said dust collecting means inside said housing, and
an accessory piece which is removably attachable to said suction inlet,
said housing including a storage section near said back end, said storage section being adapted to contain said accessory piece and provided with a door on said back end.

4,704,766
CONCEALED HINGE

Henry C. Almestad, 1261 Contra Costa Dr., El Cerrito, Calif. 94530

Filed May 11, 1982, Ser. No. 376,947
Int. Cl.[4] E05D 7/04
U.S. Cl. 16—236 8 Claims

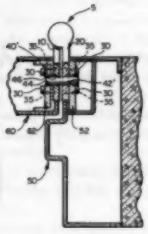


1. In combination, a door, a frame and a pair of concealed hinges for said door mavable from a closed to an open position said door having a substantially planar front face and a rear face, generally parallel planar top and bottom edge faces and a substantially planar end face intersecting said planar front face and forming a front pivot corner and mounted in said frame defining an opening having generally parallel planar top and bottom bases and said frame including a generally perpendicular jamb frame member having a substantially planar front face and presenting a substantially planar side face generally parallel to and closely spaced from said planar door end face and said pivot corner when said door is in said closed position; each of said concealed hinges comprising:
a. an elongated door plate member having a front edge, a rear edge, a pivot end edge and a distal end edge and formed with fastener openings therethrough and connected to said respective door bottom and top edge faces adjacent said door front pivot corner;
b. a base member formed with fastener openings connected to said respective top and bottom frame bases;
c. pivot means connected to said door plate member at a location adjacent said front edge and said pivot end edge and connected to said base plate member at a location overlying and underlying said door respectively; and
d. said pivot means is located with respect to said elongated door plate member and said base plate member adjacent said door front face and adjacent said door end face at a point sufficient distance from saids planar side face of said perpendicular jamb frame member and from said front face of said door so that the arc scribed by said front pivot corner of said door adjacent said perpendicular jamb frame member when said door is pivoted about said pivot means from said closed to open positions does not intersect said planar end face of said perpendicular jamb frame member, and said planar front face of said door when in said closed position is substantially parallel or in the same plane as said front face of said jamb frame member.
e. at least one of said fastener openings in said door plate members is elongated in its longitudinal direction to permit adjustment of the relative attachment of said door in a longitudinal direction; and
f. at least one of said fastener openings in said base plate member is elongated in a direction at right angles to said door when said door is in its closed postion so as to permit adjustment of the location of said base plate member relative to said frame opening.

4,704,767
SECURITY DOOR HINGE SYSTEM WITH LOCKING ELEMENTS

Robert J. Carter, Elwood, and John G. Pecis, Western Springs, both of Ill., assignors to Folger Adam Company, Lemont, Ill.

Filed Jan. 9, 1986, Ser. No. 817,402
Int. Cl.[4] E05D 5/06
U.S. Cl. 16—388 2 Claims



1. In a door hinging system of the type comprising a door, a door frame, a hinge mechanism comprised of at least a first element operative for attachment to the door and at least a second element operative for attachment to the door frame, the door and door frame each comprising a mounting face and means for attaching the first element to the door mounting face and the second element to the door frame mounting face, the improvement comprising:
at least one first locking element located on the first element

to be noncoaxial with the means for attaching the first element to the door;

at least one first lock engaging means located on the door, the at least one first lock engaging means shaped and aligned for engagement with the first locking element;

at least one second locking element located on the second element to be noncoaxial with the means for attaching the second element to the door frame and

at least one second lock engaging means located on the door frame, the at least one second lock engaging means shaped and aligned for engagement with the second locking element;

the first and second locking elements and the first and second lock engaging means operative to substantially secure the door to the door frame under forces directed substantially parallel to the door mounting face and the door frame mounting face, the first and second locking elements and the first and second lock engaging means further operative to not substantially secure the door to the door frame under forces directed substantially transverse to either the door mounting face or the door frame mounting face the first and second locking elements and one of the first and second lock engaging means comprise apertures and the other one of the first and second lock engaging means comprise a post, wherein the first and locking elements and the one of the first and second lock engaging means are shaped and aligned to engage the other one of the first and second lock engaging means, wherein one of the door and the door frame comprises a separate reinforcing plate, said post being connected to said reinforcing plate.

4,704,768

DECROPPING APPARATUS

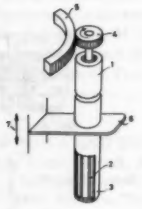
Gerardus T. M. Hutting, Wijchen, and Engelbertus J. J. M. Smulders, Boxmeer, both of Netherlands, assignors to Stork PMT B.V., An Boxmeer, Netherlands

Filed May 27, 1986, Ser. No. 867,043

Claims priority, application Netherlands, May 30, 1985, 8501556

Int. Cl.[4] A22C *21/00, 21/06*

U.S. Cl. 17—11 **9 Claims**



1. An extraction apparatus for removing inedible and undesirable parts from the neck of slaughtered poultry which have been degutted through an opening at the vent comprising:

means for suspending slaughtered birds by their legs;

a rotationally drivable extractor surrounded by a non-rotating protective sheath having a cross-section adapted to be passed through the neck of the bird, the protective sheath having a longitudinal cut-out provided in one position; and

drive means for driving the extractor.

4,704,769

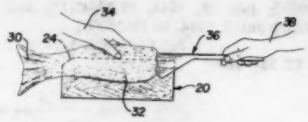
FISH FILLETING APPARATUS AND METHOD

Edward S. Hanechak, and Rita A. Hanechak, both of 118 Spring St., Johnstown, Pa. 15906

Filed Apr. 25, 1986, Ser. No. 855,930

Int. Cl.[4] A22C *25/16*

U.S. Cl. 17—46 **18 Claims**



11. A method of filleting a fish comprising:

providing a fish, a supporting block having a fish supporting portion and being of such size as to pass through the hollow of a blade, and a filleting tool having a handle and a hollow generally downwardly diverging blade, said blade having a leading edge, a trailing edge, and an intermediate connecting edge, said leading edge being a cutting edge;

placing the rib cage of the fish on said supporting block;

securing said fish on said supporting block;

inserting said tool between the backbone and flesh of said fish; and

progressively moving said tool through said fish in a generally linear direction until reaching the end of said rib cage, whereby said rib cage will be separated from said flesh by a generally linear relative movement between said filleting tool and said fish.

4,704,770

PULL TAB FOR SLIDE FASTENER

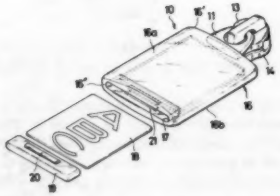
Hiroo Minami, and Sadaho Asahi, both of Uozu, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Nov. 5, 1986, Ser. No. 927,127

Claims priority, application Japan, Nov. 15, 1985, 60-176299[U]

Int. Cl.[4] A44B *19/26*; G09F *3/18*

U.S. Cl. 24—431 **12 Claims**

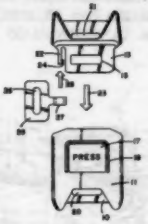


1. A slider pull tab having a link at one end thereof for connecting the same to a slider body, said pull tab comprising a pull tab body of a transparent resilient material including an upper wall and a lower wall integrally joined together and defining therebetween a chamber substantially coextensive with said body, a display card releaseably inserted through the other or open end of said pull tab body into said chamber, and an end cap means for closing said open end of said pull tab body, said upper and lower walls having a substantially equal thickness so that the pull tab provides a uniform display condition at the both sides, said display card, when inserted, fully extending in said chamber and having display surfaces on both sides thereof, said display surfaces each having an area substantially equal to either side surface area of said pull tab body.

4,704,771
LOCK FOR SAFETY BELTS AND LOCK TONGUE THEREOF

Christer H. Örje, Bad Schwartau, Fed. Rep. of Germany, assignor to Broderna Holmbergs Fabriks AB, Anderstorp, Sweden

Filed May 28, 1985, Ser. No. 738,674
Int. Cl.[4] A44B *11/26*
U.S. Cl. 24—574 **2 Claims**

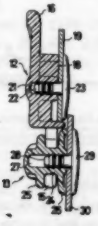


1. A safety buckle comprising a frame including spaced sidewalls to be connected to at least one first strap and forming a slot-like insert opening having a flared entrance portion defined by two opposite walls extending along the major dimension of the slot-like insert opening between said spaced sidewalls and converging towards the insert opening, said entrance portion including a recess in each sidewall at the ends of said converging walls, said recesses open in a direction opposite the direction of insertion of said tongue, a latch member pivotally mounted to the frame, a tongue plate to be connected to at least one second strap and insertable into said opening through said flared entrance portion, spring means biasing said latch member to a position of engagement with said tongue plate when inserted in said opening, a spring plate accessible for finger pressure for operating the latch member against the spring bias to a disengaged position to release the tongue plate from the latch member, a pin formed as a part of said tongue plate at one side edge thereof and projecting towards a free end thereof in the direction of insertion of the tongue plate, and a fitting to be connected to a third strap and forming a socket to be passed onto said pin from the free end thereof, said flared entrance portion receiving the fitting when passed onto the pin, the fitting projecting laterally beyond the sidewall through one recess of the flared entrance portion.

4,704,772
SNAP-FIT CLASP FASTENER FOR BAGS

Kazumi Kasai, Namerikawa, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Oct. 30, 1986, Ser. No. 924,972
Claims priority, application Japan, Nov. 2, 1985, 60-169682[U]
Int. Cl.[4] A44B *17/00*
U.S. Cl. 24—669 **3 Claims**



1. A snap-fit clasp fastener for releasably connecting first and second portions of a bag for closing an opening in the bag, said clasp fastener comprising:

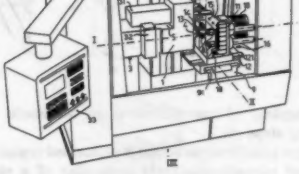
(a) a catch member molded of a synthetic resin and adapted to be mounted on the first portion of the bag, said catch member including a body having an underside engageable with the first portion, a pair of resiliently flexible legs projecting from an end of said body in a common direction and having a pair of confronting arcuate recessed portions, respectively, and a grip head extending from an opposite end of said body in parallel with said legs, said grip head being thinner than said body and spaced from said underside of said body; and

(b) a retainer member molded of synthetic resin, adapted to be mounted on the second portion of the bag and releasably couplable with said catch member, said retainer member including a cylindrical retaining portion snappingly receivable into said recessed portions, and a pair of flanges on opposite ends of said retaining portion.

4,704,773
MACHINE TOOL STRUCTURE

Pierre Quinart, La Balme de Sillingy; Georges Schoellhammer, Cluses; Pierre Tableau, Pringy, and Francois Vivien, Veyrier-du-Lac, all of France, assignors to Machines Outils Wirth et Gruffat, France

Filed Jun. 12, 1986, Ser. No. 873,624
Int. Cl.[4] B23B *9/00*
U.S. Cl. 29—27 C **8 Claims**



1. A machine tool comprising:

a. a work-piece-holding rotatable spindle;

b. drive means for driving said spindle rotationally at lathe speed about a horizontal axis;

c. a tool-holding assembly movable in horizontal translation with respect to the spindle along a longitudinal axis parallel to the spindle axis and also along a transverse axis perpendicular to the spindle axis, said tool-holding assembly being adapted to receive fixed tools and rotatable tools;

d. tools mounted fixedly on the tool-holding assembly;

e. means mounted on the tool-holding assembly for driving the rotatable tools rotationally;

f. a carriage on which said work-piece-holding spindle is mounted, said carriage being slidable on guides of the frame along a vertical axis;

g. said drive means for driving said spindle comprising at least one motor and electronic control means for adjusting the speed of rotation of the spindle and for stopping said spindle in successive given angular positions;

h. said means mounted on said tool-holding assembly for driving the rotatable tools including through bores for receiving and holding in position auxiliary work units with independent drive;

i. said rotatable tools being arranged in a first family having horizontal axes parallel to the axis of the spindle and a second family having horizontal axes perpendicular to the axis of the spindle;

j. said second family comprising a row of tools with horizontal axes along a vertical line;

k. said tool-holding assembly comprising two vertical walls perpendicular to each other having a vertical outer face having holes mounted for fixing a turning-tool holding plate, one of said walls having a series of horizontal through bores parallel to the axis of said spindle for receiving auxiliary work units, the other of said walls having a series of horizontal through bores perpendicular to the axis of the spindle for receiving auxiliary work units, and fixing holes for mounting different equipment in the upper part of said tool-holding assembly.

4,704,774

ULTRASONIC TRANSDUCER AND METHOD OF MANUFACTURING SAME

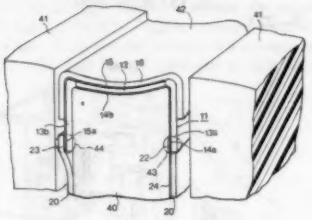
Tadashi Fujii; Hiroyuki Yagami, both of Fujinomiya; Iwao Seo, and Masahiro Sasaki, both of Ami, all of Japan, assignors to Terumo Kabushiki Kaisha and Mitsubishi Petrochemical, both of Tokyo, Japan

Division of Ser. No. 815,562, Jan. 2, 1986, abandoned. This application Mar. 31, 1987, Ser. No. 32,750

Claims priority, application Japan, Jan. 10, 1985, 60-1402

Int. Cl.[4] H01L *41/22*

U.S. Cl. 29—25.35 **3 Claims**



1. A method of manufacturing an ultrasonic transducer comprising steps of:

forming a polarized portion at a prescribed region of a plate-shaped piezoelectric body consisting of a piezoelectric polymer material, having opposing first and second main surfaces by bringing first and second electrical conductors into intimate contact with the first and second main surfaces, respectively, and applying a voltage at least across the first and second electrical conductors, thus also forming a unpolarized portion contiguous to the polarized portion;

depositing a first electrode on the first main surface to cover the polarized portion and to extend over a first region of the unpolarized portion, and a second electrode on the second main surface to cover the polarized portion and to extend over a second region of the unpolarized portion, said first and second electrodes each comprising an electrical conductor;

depositing a first electrically conductive lead on either of two opposing main surfaces of a flexible substrate, and a second electrically conductive lead on either of said two opposing main surfaces of the flexible substrate;

bonding an end portion of said first electrically conductive lead to said first electrode at an edge portion thereof extended over said first region of the unpolarized portion polarized portion, and an end portion of said second electrically conductive lead to said second electrode at an edge portion thereof extended over the second region of the unpolarized portion; and

effecting bonding to a backing member at least one surface of which is plate-shaped, with the polarized portion being situated on said plate-shaped surface of the backing member and the edge portions of said first and second electrodes being situated on first and second side surfaces, respectively, of the backing member.

4,704,775

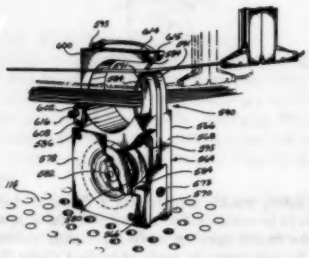
TURN GATE FOR USE WITH A ROBOTIC WIRE HARNESS ASSEMBLY SYSTEM

Dan A. Cross, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 741,318, Jun. 4, 1985, Pat. No. 4,677,734. This application Nov. 18, 1985, Ser. No. 798,999

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—33 M **14 Claims**



1. A turn gate for receiving and supporting a plurality of wire segments at a bend in a wire harness assembled by a robot, the bend having an inner radius and an outer radius, the turn gate comprising:

(a) a base inluding a finger;

(b) a bracket on the base, the bracket having an outer end located adjacent to the outer end of the finger, defining an entry gap with the finger through which the wire segments are received;

(c) a guide member, interconnected between the bracket and the base and extending across the entry gap, for directing each wire segment received through the entry gap to the inner radius of the bend, wherein the guide member is a cord, one end of the cord being fixed to the bracket; and

(d) a reel housed within the base, the other end of the cord being coiled around the reel; the reel including means for maintaining tension in an extended portion of the cord.

4,704,776

PRESS ROLL FOR PAPER MACHINES

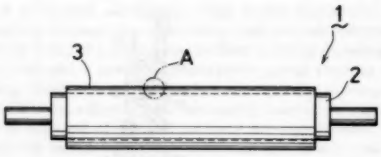
Atsuo Watanabe, Hirakata, and Mikio Fukumitsu, Katano, both of Japan, assignors to Yamauchi Rubber Industry Co., Ltd., Osaka, Japan

Filed Apr. 25, 1986, Ser. No. 856,596

Claims priority, application Japan, Apr. 30, 1985, 60-94257

Int. Cl.[4] B30B *3/04*

U.S. Cl. 29—132 **19 Claims**



1. A paper machine press roll comprising a metal core, a ground layer comprising a metal layer formed over the outer periphery of the core and having a smaller coefficient of expansion than the surface material of the core, and a ceramic layer formed over the ground layer having a porosity of 1 to 30%

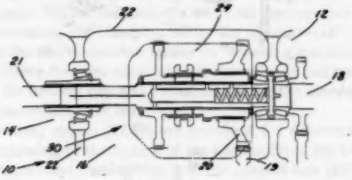
the surface of the ceramic layer having a surface roughness or 0.1 to 3s (R max).

4,704,777

CREEPER INSTALLATION METHOD AND APPARATUS

David V. Schaefer, Burlington, and Richard J. Honeyager, Oshkosh, both of Wis., assignors to J. I. Case Company, Racine, Wis.

Filed May 16, 1986, Ser. No. 863,779
Int. Cl.[4] B21H *7/00*; B21K *19/00*
U.S. Cl. 29—148.3 **6 Claims**



1. A method for replacing a noncreeper subassembly with a creeper subassembly in a transmission with a window adjacent to the noncreeper subassembly, each such subassembly having a first end and an opposite second end and being joined at its first end by its main shaft to a transmission shuttle shaft by splining of opposed distal ends of such shafts, which are axially spaced to form a void therebetween, in opposite ends of a collar journaled in a bearing cup on a transmission case orifice, each subassembly having stop means on its main shaft limiting shaft insertion in the collar, comprising:

opening the window:

reaching through the window and unseating the noncreeper collar from the bearing cup such that said collar no longer joins the main shaft to the shuttle shaft;

moving the noncreeper subassembly in the void toward the shuttle shaft to unseat the noncreeper second end, and from that position manipulating the noncreeper subassembly out of the case through the window;

inserting a creeper subassembly through the window and into the case, said creeper main shaft having a creeper collar thereon and means to secure the creeper collar in position;

aligning the creeper subassembly;

securing the creeper collar into engagement with the shuttle shaft by positioning of said stop means; and

closing the window by securing to the case a window cover which supports a layshaft assembly and shift apparatus for engagement with the creeper subassembly.

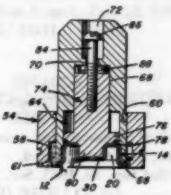
4,704,778

VALVE MOUNTING ASSEMBLY FOR AEROSOL CONTAINERS AND THE LIKE

Werner A. Radtke, Vernon Hills, and Joseph L. Roe, Des Plaines, both of Ill., assignors to Plastic Specialties and Technologies, Inc., Barrington, Ill.

Division of Ser. No. 677,555, Dec. 31, 1984, Pat. No. 4,621,964, which is a division of Ser. No. 395,434, Jul. 6, 1982. This application Apr. 25, 1986, Ser. No. 855,937
Int. Cl.[4] B23P *19/02*
U.S. Cl. 29—235 **7 Claims**

1. Apparatus for use in the assemblying of a planar gasket to a mounting cup having a cylindrical central projecting body surrounded by an annular gasket receiving channel; said apparatus comprising a guide bushing, a through passage defined through said bushing and opening through opposite first and second ends of the bushing, said passage being adapted to receive therein adjacent the first end a planar gasket having top and bottom flat surfaces with inner and outer coaxial peripheral edges, an inserter introducible through the second end and longitudinally moveable through said passage, said bushing passage, adjacent the first end, has an annular gasket positioning recess defined therein, said inserter having a leading end for first contacting said gasket top surface, a chamber defined in said inserter and opening through said leading end to define a gasket engageable annular edge for engaging said gasket inner peripheral edge after said leading edge contacts said



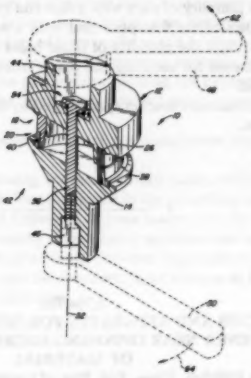
gasket top surface, said chamber being adapted for partial reception of the central body of a mounting cup therein through the first end of the bushing with the annular edge of the inserter adapted to engage the gasket inner peripheral edge and effect a seating of the gasket by curling the gasket bottom surface outwardly and circularly into intimate frictional engagement with the gasket receiving channel as the projecting body of the cup moves into the chamber of the inserter.

4,704,779

TOOL FOR TORQUING ROTATABLE MEMBERS

Giuseppe Lauritano, 534 Laurel St., Redwood City, Calif. 94063

Filed Sep. 8, 1986, Ser. No. 904,504
Int. Cl.[4] B25B *13/06*
U.S. Cl. 29—240 **5 Claims**



1. A tool for turning a first member rotatable in relation to a second member, to a certain degree of torque, by using a torque arm tool, comprising:

a. a first portion capable of engaging said first member for movement therewith about an axis;

b. a second portion capable of engaging said second member for movement therewith about said axis;

c. means for rotating said first portion relative to said second portion a sufficient degree while engaging said first and second members, respectively, to achieve the certain degree of torque; and

d. means for holding said first portion in alignment with said second portion relative to said axis, during said rotation of said first portion relative to said second portion, said holding means including a threaded opening through said

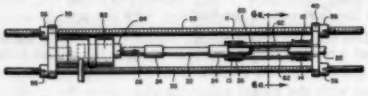
first portion, a threaded opening in said second portion, and a threaded member threadingly engaging said threaded openings in said first and second members.

4,704,780

APPARATUS FOR REPLACING A TRUNNION BRACKET SPINDLE

Darcel R. Moffett, Munster, Ind., assignor to Judy's Walking Beam Service, Inc., Griffith, Ind.

Filed Sep. 30, 1985, Ser. No. 781,983
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—252 **8 Claims**



1. Apparatus for replacing a trunnion spindle mounted in trunnion brackets of a tandem bogie truck suspension comprising:

(a) a first plate having a perpendicularly attached ram mounting pin, and a plurality of holes through the plate spaced from the alignment pin;

(b) a second plate having a spindle access hole larger in diameter than the spindle and a plurality of other holes spaced from the spindle access hole;

(c) a plurality of rods with a first end extending through the holes of the first plate and with a second end extending through the plurality of other holes of the second plate;

(d) means for securing the plates from sliding off the rods and

(e) a trunnion bracket spacer sized to fit between the brackets.

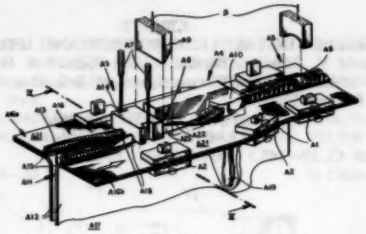
4,704,781

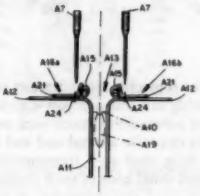
PROCESS AND APPARATUS FOR MOUNTING A SLIDE FASTENER NEAR OPPOSING EDGES OF TWO PIECES OF MATERIAL

Alfons Fröhlich, Essen, Fed. Rep. of Germany, assignor to Opti Patent- Forschungs-und Fabrikations-AG, Riedern-Allmeind, Switzerland

Filed Jul. 31, 1986, Ser. No. 892,701
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1985, 3527894; Aug. 3, 1985, 3527895
Int. Cl.[4] B21D *53/50;* **A41H** *37/06;* **D05B** *3/12, 29/00*
U.S. Cl. 29—408 **12 Claims**

1. In a process for mounting a slide fastener segment or slide fastener near the opposing edges of two pieces of material, particularly on a slit in a piece of clothing, a slide fastener strip, said slide fastener segment or said slide fastener and said pieces of material being fed to the sewing stations of a two needle sewing machine, the improvement wherein said pieces of material in the region between said sewing stations form a gap and are curved so that a portion of each hangs substantially vertically from two fold edges or creases into an intervening space between both of said sewing stations and both slide fastener halves of an open one of said slide fastener segments or an open





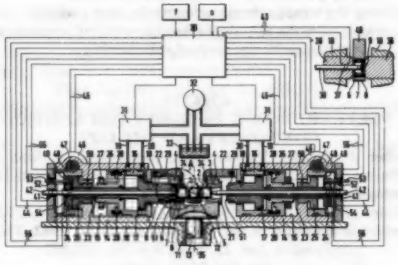
one of said zippers are sewn on from above on said pieces of said material along said fold edges.

4,704,782

UNIVERSAL JOINT ASSEMBLY METHOD AND APPARATUS

Karl Spiess; Waldemar Baberowski, both of Herzogenaurach, and Otto Glatter, Sterpersdorf, all of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Oct. 1, 1986, Ser. No. 913,952
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1985, 3537234
Int. Cl.[4] B23P *11/00, 21/00;* **B23Q** *15/00*
U.S. Cl. 29—434 **31 Claims**



1. A method of assembling a universal joint comprising two shafts provided with yokes at their ends and connected by means of a universal joint spider having journals supported in bores in the yokes by means of bearing cups which are unilaterally closed by a bottom wherein the end faces of the journals abut against the bottoms of the bearing cups, said method comprising initially centering the universal joint spider and the shafts relative to each other and stationarily clamped,

then pressing the bearing cups in the bores in the yokes and axially fixed therin wherein the yoke arms, if necessary, are widened radially outwardly and are always immovably fixed radially inwardly, characterized by measuring or determining the axial position for each bearing cup (6) in the respective bore (3) of the yoke (5) in which the bottom (9) of the bearing cup (6) abuts against the end face (34) of the respective journal (1) and terminating the pressing process of the bearing cup (6) in this position or based on this position, continuing the pressing process under elastic flexion of the bottom (9) of the bearing cup (6) by a defined dimension (f) wherein the pressing force acts upon the bottom (9) solely at its outer edge.

16. An apparatus for assembling a universal joint comprising a frame, centering and clamping means for the universal joint spider and the shafts, optional means for widening and always means for fixing the yoke arms, a ram for pressing in and means for fixing the bearing cup and a control unit for the asembling process, characterized in that

(a) measuring means (57,58) are provided for determining the beginning of the flexion of the bottom (9) of the bearing cup (6) and transmitting it to the control unit (61).

(b) means (24,25) for termination of the pressing process are provided which can be actuated by the control unit (61), and

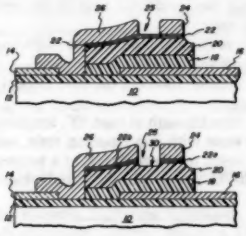
(c) the control unit (61) in which optionally the defined dimension (f) can be stored actuates the means (24,25) for termination of the pressing process so that the latter is terminated upon beginning of the elastic flexion of the bottom (9) of the bearing cup (6) or after continuation of the pressing process by a defined dimension (f).

4,704,783

METHOD FOR PASSIVATING THE BACK CHANNEL OF AMORPHOUS SILICON FIELD EFFECT TRANSISTORS

George E. Possin, Schenectady; Harold G. Parks, and William W. Piper, both of Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 5, 1986, Ser. No. 859,526
Int. Cl.[4] H01L *29/78*
U.S. Cl. 437—40 **10 Claims**



1. A method for passivating the back channel region of amorphous silicon field effect transistors, said method comprising the following ordered sequence of process steps:

sputter etching doped amorphous silicon material at the bottom of a gap in an overlying metal layer;

plasma etching said doped amorphous silicon material and a portion of an underlying amorphous silicon layer;

exposing said amorphous silicon surface to a basic solution; and

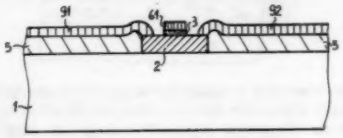
depositing a passivating dielectric layer over said field effect transistor.

4,704,784

METHOD OF MAKING THIN FILM FIELD EFFECT TRANSISTORS FOR A LIQUID CRYSTAL DISPLAY DEVICE

Nicolas Szydlo, Limours; Francois Boulitrop, Sceaux, and Rolande Kasprzak, Gif sur Yvette, all of France, assignors to Thomson-CSF, Paris, France

Filed Jun. 19, 1985, Ser. No. 746,316
Claims priority, application France, Jun. 22, 1984, 84 09875
Int. Cl.[4] H01L *21/425*
U.S. Cl. 437—41 **14 Claims**



1. A method for the manufacture of at least one coplanar thin film field effect transistor with self-alignment of the electrodes, wherein the method comprises the eight following successive stages:

first stage: successively depositing on a substrate a semiconductor coating and a gate insulant coating,

second stage: defining mesas by a first set of resin masks and etching the resulting exposed semiconductor and gate insulant coatings down to the level of the substrate, to form mesas on the substrate, each of the mesas serving to form a transistor,

third stage: depositing a passivation insulant coating on the substrate and the resin masks and exposing the gate insulant by removing the passivation insulant down to the level of the gate insulant and removing the resin mask,

fourth stage: depositing an electrode layer on the passivation and gate insulant layers and forming gate electrodes by depositing a second set of resin masks over a portion of the gate insulant and removing the remaining electrode layer,

fifth stage: etching the gate insulant coating not covered by the gate electrodes until the semiconductor coating is exposed,

sixth stage: forming source and drain regions by ion implantation,

seventh stage: eliminating the second resin masks, followed by activation of the ions implanted in the preceding stage,

eighth stage: forming a third set of resin masks over the gate electrode and depositing source and drain electrode layers on the structure obtained in the previous stage and removing the third resin and the electrode layer thereon to form source and drain electrodes.

4,704,785

PROCESS FOR MAKING A BURIED CONDUCTOR BY FUSING TWO WAFERS

Patrick A. Curran, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 1, 1986, Ser. No. 893,437
Int. Cl.[4] H01L *21/385, 21/40*
U.S. Cl. 437—110 **9 Claims**

1. A process for making a buried low impedance conductor in a crystalline lattice substrate, comprising:

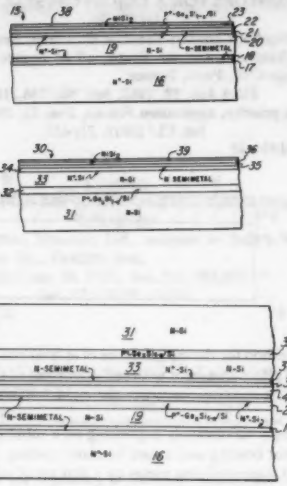
providing a host wafer;

providing a guest wafer having a crystal orientation substantially the same as that of the host wafer;

fusing at least one unipolar conductor layer to one of said wafers; and

bringing the host and guest wafers into intimate contact at an

elevated temperature in an inert ambient with said unipolar conductor therebetween, whereby native oxides are



broken up and any excess oxygen is diffused into the host and guest lattices leaving exposed bond orbitals.

4,704,786

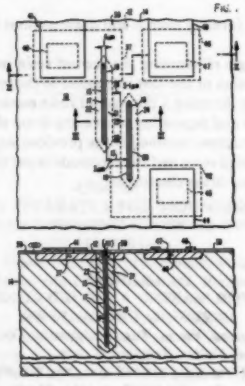
METHOD OF FORMING A LATERAL BIPOLAR TRANSISTOR IN A GROOVE

Francis J. Kub, Pasadena, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 405,000, Aug. 4, 1982, Pat. No. 4,549,196. This application Sep. 23, 1985, Ser. No. 778,951

Int. Cl.[4] H01L *27/22, 29/82, 29/96*

U.S. Cl. 437—32 **14 Claims**



1. A method of forming a lateral bipolar transistor in a substrate of semiconductor material having an upper surface and a predetermined crystalline orientation, said method including the steps of:

(a) doping the substrate with impurities of a first type;

(b) forming at least two predeterminedly spaced apart narrow grooves extending from the upper surface into the substrate;

(c) forming laterally extending emitter and collector regions by laterally diffusing impurities of a second type through the sidewalls of said grooves, which lateral diffusion extends a distance predetermined to be less than the spacing between the adjacent grooves to thereby form the lateral bipolar transistor with the first type doped substrate forming the base region between the second type doped emitter and collector regions;

(d) forming spaced apart emitter and collector contact regions of said second type in the substrate extending downwardly from said upper surface to intersect with the laterally extending emitter and collector regions about said grooves;

(e) forming a base contact of said first type at the upper surface of the substrate over the base region defined between the second type emitter and collector regions.

4,704,787

PROCESS FOR PRODUCTION OF THE WINDING OF AN ELECTRICAL MACHINE

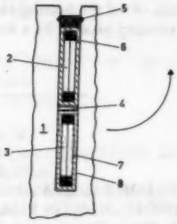
Kurt Herzog, Schlieren, and Roland Schuler, Wettingen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Oct. 21, 1986, Ser. No. 921,264

Claims priority, application Switzerland, Nov. 25, 1985, 5028/85

Int. Cl.[4] H02K *15/14*

U.S. Cl. 29—596 **6 Claims**



1. A process for producing a winding in a core in an electrical machine, said winding containing conductor rods having several mutually insulated conductor elements, each rod being surrounded by insulation, which process comprises:

(a) impregnating the conductor rods in the entirety with impregnating resin,

(b) heating the resin at a temperature sufficient to effect substantially complete curing of the same,

(c) cooling the core or allowing the core to cool to ambient temperature,

(d) turning the core through at least 90°, longitudinally, and flooding the same with impregnating resin, and

(e) heating the resin, to effect curing, at a temperature of at least about 20° C. lower than the temperature of the first heating step.

4,704,788

METHOD FOR MAKING MAGNETIC HEADS

Karlheinz Eckstein, Fuerth, Fed. Rep. of Germany, assignor to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig Helland, Stiftung & Co. KG, Fuerth, Fed. Rep. of Germany

Filed Nov. 13, 1986, Ser. No. 930,740

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1985, 3542242; May 31, 1986, 3618427

Int. Cl.[4] G11B *5/127*

U.S. Cl. 29—603 **8 Claims**

1. A method of making a magnetic head having core halves made of a magnetic material such as ferrite, with a magnetic

material of a high permeability being affixed thereto in an operational magnetic gap area, comprising the following steps:

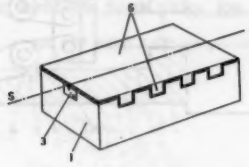
providing a block of magnetic material such as ferrite;

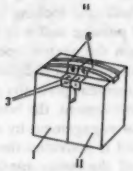
providing a first groove in said block in a first direction;

filling said first groove with a non-magnetic material such as glass;

providing a plurality of second grooves in said block in a second direction perpendicular to the direction of the first groove, with the depth of the second groove being predetermined so as to correspond to the desired gap height and the width of said second grooves corresponds to a desired track width;

providing an adhering layer on said block including on said second grooves;





providing highly permeable magnetic material layer on said adhering layer which includes the filling of said second grooves therewith;

dividing said block along said first groove into block halves;

providing in at least one of said halves a winding space adapted to receive a coil winding;

providing a non-magnetic material on said respective block halves;

reconnecting said respective block halves along respective faces and orienting each as such so as to substantially align respective portions of the second grooves with said non-magnetic material being between the reconnected block halves;

working the block to form the desired head surface configuration; and

separating the block into respective magnetic heads.

4,704,789

METHOD OF MANUFACTURING ELECTROMAGNETIC MEMBERS

Motoya Ito, Katsuta; Noriyoshi Takahashi; Masatoshi Watanabe, both of Hitachi; Toshimi Abukawa, Hitachiota; Takeshi Seya; Hiroshi Kainuma, both of Hitachi, and Toshiyuki Syutoo, Ibaraki, all of Japan, assignors to Hitachi, Ltd. and Hitachi Cable, Ltd., both of Tokyo, Japan

Filed Feb. 26, 1986, Ser. No. 832,888

Claims priority, application Japan, Feb. 27, 1985, 60-36424

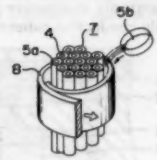
Int. Cl.[4] H01F *41/02, 7/00*

U.S. Cl. 29—609 **8 Claims**

1. A method of manufacturing an electromagnetic member by filling spaces among a plurality of parallelly arranged magnetic strips with an electrically conductive material, comprising the steps of:

a. coating an outer circumferential surface of each of said plurality of magnetic strips with a first electrically conductive material to a predetermined thickness to thereby form a plurality of composite magnetic strips;

b. binding said plurality of composite magnetic strips into a bundle and fixedly holding said bundle; and



c. filling spaces among said plurality of composite magnetic strips in the bundle with a second electrically conductive material, in which said second electrically conductive material is of the same kind as said first electrically conductive material.

4,704,790

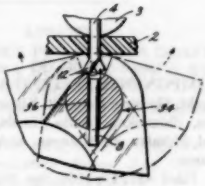
METHOD AND APPARATUS FOR ATTACHING COMPONENTS TO SUBSTRATES

Henry J. Soth, Brackney, Pa., assignor to Universal Instruments Corp., Binghamton, N.Y.

Filed Dec. 6, 1985, Ser. No. 805,693

Int. Cl.[4] H05K *3/30*

U.S. Cl. 29—838 **9 Claims**



1. In a method of attaching a component to a substrate by deforming at least one lead protruding from a bottomside of said substrate, said lead extending from a topside and through a hole of said substrate to said bottomside, the improvement comprising the steps of:

splitting at least a portion of said protruding lead generally longitudinally to provide furcations; and

displacing at least one of said furcations laterally of a longitudinal axis of said protruding lead in order to effect said attaching.

4,704,791

PROCESS FOR PROVIDING A LANDLESS THROUGH-HOLE CONNECTION

LeRoy N. Chellis, Endwell, and Theron L. Ellis, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 5, 1986, Ser. No. 836,376

Int. Cl.[4] H01K *3/10*

U.S. Cl. 29—852 **12 Claims**

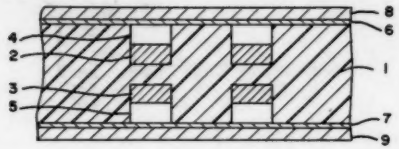
1. A process for connecting at least two electrically conductive patterns through a dielectric material by a landless electrical connection which comprises:

A. providing a dielectric material having a first electrically conductive pattern on a first major surface thereof and a temporary support layer covering said first electrically conductive pattern and said first major surface of said dielectric material;

B. providing on a second major surface of said dielectric

material opposite said first major surface thereof a second electrically conductive pattern and a temporary support layer covering said second electrically conductive pattern and said second major surface of said dielectric material;

C. providing interstitial through-holes connecting said first electrically conductive pattern and said second electrically conductive pattern;



D. plating said through-holes with an electrical conductor to thereby electrically connect said first electrically conductive pattern with said second electrically conductive pattern; and

E. removing both of the support layers by peeling to thereby provide a landless electrical connection between the first and second electrically conductive pattern.

4,704,792

COMPONENTS FEEDING APPARATUS

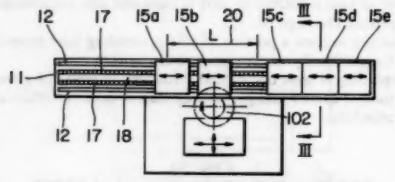
Masato Itagaki, Shimizu; Katsuaki Kikuchi, Tsuchiura; Susumu Nakayama, Shizuoka; Yoshio Haeda, Yaizu, and Takashi Kawakami, Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 17, 1986, Ser. No. 853,178

Claims priority, application Japan, Apr. 17, 1985, 60-80101

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—741 **7 Claims**



7. An electronic component feeding apparatus for an electronic component mounting machine, comprising a supply table divided into a plurality of tables having several types of electronic components mounted thereon, a drive means for moving each table on the same straight line separately and for placing each table at a predetermined position on said line which is opposed to a transfer mechanism in response to a command from a control unit, the tranfer mechanism conveying said electronic components from said tables to a board placed on an X–Y table and mounting said components on said board, the X–Y table fixing and stopping the board at a predetermined position, and a board transport section for transporting said board on said X–Y table and delivering the board having the electronic components mounted thereon.

4,704,793

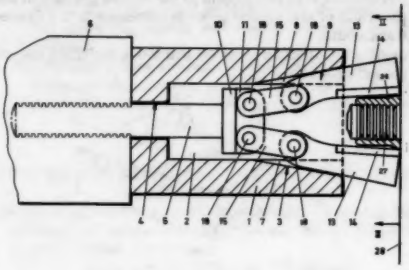
COLLAR SPLITTERS FOR LOCK BOLT FASTENING SYSTEMS

Joseph Lockey, Newcastle Under Lyme, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Sep. 16, 1985, Ser. No. 776,516

Int. Cl.[4] B26B *7/00*

U.S. Cl. 30—187 **5 Claims**



1. A collar splitter for disconnecting a lock bolt fastening system having a lock bolt and locking collar, comprising a body defining a central passage and a central opening at one end of the body, wherein the central opening has outwardly sloped sidewalls, a rod component slidable within the passage, and a cutter blade arrangement pivotally mounted on the rod component for pivotal movement, the body and the rod component being adapted for engagement by a powered tool such that in use when the tool is activated the rod component together with a portion of the cutter blade arrangement slide relative to and within the passage, and the blade arrangement co-operating with the sloped sidewalls of the central opening such that in use when the cutter blade arrangement is engaged on the locking collar and the tool is activated, inward axial movement of the rod component imparts radially inwardly and parallel cutting movement of the cutter blade arrangement evenly to split the locking collar to disconnect the lock bolt fastening system.

4,704,794

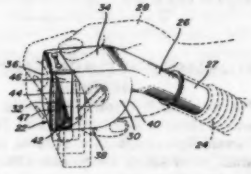
SUCTION TYPE HAIR CLIPPER

Benoit Paradis, 1164 Bagot Street, Longueuil, Canada J4M 1E3

Filed Jul. 1, 1985, Ser. No. 750,157

Int. Cl.[4] B26B *19/20*

U.S. Cl. 30—133 **7 Claims**



1. A suction type hair cutting device comprising, in combination, a closed box-like hollow casing having substantially parallel first and second walls and a third wall orthogonal to said first and second walls, a scissor-member and a fixed member mounted about a first aperture made in said first wall and through which hair is to be engaged and cut, said third wall having a second aperture with means for connection to a suction means for producing an air flow in between said first aperture and said second aperture, a shaft freely rotatably

journalled in said casing first and second walls, vanes radially mounted to said shaft and in longitudinal registry with said second aperture, said shaft and vanes offset from said first aperture; and a link member pivotally interconnecting said scissor-member to said shaft, whereby rotation of said vanes under action of said air flow causes said link member to operatively actuate said scissor-member in its shearing action.

4,704,795

ADJUSTABLE SCRAPER

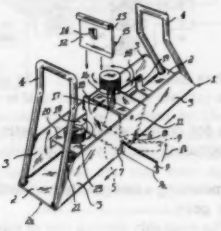
John V. Primich, 337 Highland Rd., Kensington, 2094, Johannesburg, South Africa

Filed Feb. 21, 1986, Ser. No. 832,541

Claims priority, application South Africa, Feb. 22, 1985, 85/1360

Int. Cl.[4] B26B *3/00*

U.S. Cl. 30—169 **6 Claims**



1. A scraper device comprising

a carrier presenting a working face, the carrier being adapted removably to mount an elongate scraper blade such that a longitudinally extending working edge of the scraper blade protrudes transversely from the working face and portion of the scraper blade can project from the carrier on at least one side of the carrier to permit a projecting portion of the scraper blade to be severed from a portion of the blade which is operatively mounted on the carrier;

the carrier being adapted removably to mount the scraper blade in any one of at least two operative positions in which the plane of the blade is located at different angles to the working face;

the carrier including a slot formation for each of the operative positions, each slot formation being adapted to receive at least portion of the scraper blade and the different slot formations being disposed at different angles to the plane of the working face of the carrier;

said scraper device further including means adapted releasably to secure the scraper blade in any one of the operative positions on the carrier, the securing means composing a backing for each of the slot formations, each backing being fast with the carrier and located adjacent its slot formation; and means for clamping the scraper blade against any one of the backings, the clamping means comprising at least one clamp member movable towards and away from a backing; and common displacement means which is pivotally mounted on the carrier and is adapted to urge the clamp member towards the one or the other backing.

4,704,796

FRAMER

Glenn G. Gauer, 2414 NE. 46th, Portland, Oreg. 97213

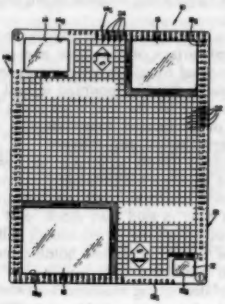
Filed May 12, 1986, Ser. No. 862,130

Int. Cl.[4] G01B *3/00*

U.S. Cl. 33—1 B **33 Claims**

1. A framer for selecting and defining the position of a portion of a visual work having fixed references such as borders comprising:

an overlay having a visual aperture defined therein of a preselected size and proportion capable of being placed over such visual work and moved relative thereto to place said aperture over a selected portion of such work, said



overlay further having a plurality of aperatures therein of different sizes with discrete series of communication indicia for each said aperature, and

communication indicia positioned along at least two regions of said overlay and disposed at substantial angles relative to each other for denoting the position of said aperture relative to the fixed references on the work.

4,704,797

DRAWING DEVICE FOR USE IN A DRAFTING MACHINE AND A DRAWING PENCIL USED THEREWITH

Kenichiro Iai, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Aug. 20, 1986, Ser. No. 898,190

Claims priority, application Japan, Aug. 30, 1985, 60-131702[U]; Aug. 30, 1985, 60-131703[U]

Int. Cl.[4] B43L *13/00*

U.S. Cl. 33—18.1 **7 Claims**

1. A drawing device for use in a drafting machine comprising:

a base movable to any desired position;

at least one holder unit mounted integrally on the base,

at least one drawing pencil fixedly mounted on the holder unit;

a driving arrangement capable of moving part of the drawing pencil longtitudinally thereof relative to said base; and

a stopper means adapted to limit the upward movement of

movable componenent parts of said drawing pencil relative to the base,

said drawing pencil comprising

(a) a casing fixedly secured to said holder unit;

(b) a lead guide fixedly secured to the lower end of the casing;

(c) a pipe member slidably mounted in said casing;

(d) a chuck ring fixedly secured to the lower end of the pipe member;

(e) a sleeve tightly fitted and fixedly secured to the outer peripheral surface of the upper part of the pipe member and connected to said driving arrangement;

(f) a lead stock slidably mounted in said pipe member and having a space for the lead stock and a lead insertion hole formed or perforated longitudinally in the upper and lower parts thereof, respectively;

(g) a lead chuck fixedly secured to the lower end of the lead stock and having a longitudinally extending lead insertion hole which communicates rectilinearly with the lead insertion hole in said lead stock, said lead chuck being capable of deforming or expanding and contracting radially so as to achieve its lead holding function in cooperation with said chuck ring;

(h) a first coiled spring mounted bedtween said chuck ring and said lead stock so as to bias normally upwards the lead stock and the lead chuck relative to said pipe member and said chuck ring; and

(i) a means for radially contracting the lead chuck to enable the lead to be held by the lead chuck when the latter is biased upwards by the resilient force of the coiled spring relative to the chuck ring.

4,704,798

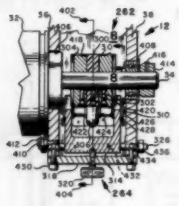
MEASUREMENT DIGITIZER

Edwin A. Hird, 10200 DeSota Avenue #331, Chatsworth, Calif. 91311

Continuation of Ser. No. 392,342, Jun. 25, 1982, which is a continuation-in-part of Ser. No. 783,608, Apr. 1, 1977, Pat. No. 4,419,672, Ser. No. 189,754, Sep. 23, 1980, Pat. No. 4,506,336, and Ser. No. 702,745, Jul. 6, 1976, Pat. No. 4,535,415. This application May 29, 1986, Ser. No. 868,019

Int. Cl.[4] G01B *3/12*

U.S. Cl. 33—138 **28 Claims**



2. A product for bidirectionally interconverting linear and rotary motions, said product comprising:

a rack consisting of a cross-sectionally curved tape and thereby having a convex surface, and said rack having at least one row of perforations longitudinally disposed along at least one of its sides, and said rack being radially bent toward said surface and forming a convex bend;

circular means supporting said rack bent convexly thereon, and said perforations in said bend projecting beyond said circular means;

rotatable axial means, and including means supporting said axial means; and

at least one wheel having sprockets, and said circular means and said at least one wheel being coaxially aligned with and fastened to said axial means, and a number of said sprockets mating with said perforations projecting beyond said circular means whereby longitudinal motions of said rack cause said rack to rotate convexly on said circular means and said perforations at said bend to fall upon, mate with, rotate with and rise from said sprockets and thereby interconvert linear motions of said rack and rotary motions of said sprockets.

4,704,799

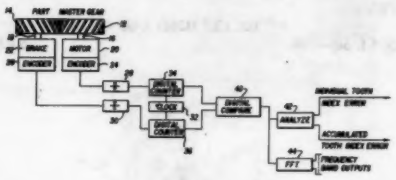
MASTER GEAR ERROR COMPENSATION

Robert G. Kobetsky, Chicago, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Sep. 25, 1986, Ser. No. 911,476

Int. Cl.[4] G01B *7/28*

U.S. Cl. 33—179.5 R **21 Claims**



7. Apparatus for compensating for master gear error in a gear checking apparatus employing a preselected master gear comprising:

a fixture for mounting a test gear to be checked in mesh with said master gear;

drive means for rotatably driving one of said master and test gears;

signal generating means responsive to differential movement between the master and test gears for producing a test signal corresponding to said differential movement between the gears during rotation thereof caused by imperfections or irregularities in both of the gears;

signal processing circuit means for processing said test signal to form a plurality of individual error signals, each corresponding to engagement of a given tooth of the master gear with a given tooth of the test gear;

and computing means for developing a series of mean signals, each corresponding to the mathematical mean of all of the error signals developed with respect to a single master gear tooth during engagement with a plurality of the test gear teeth, and for applying each of said mean signals to the error signals developed for the corresponding master gear tooth to compensate for master gear error.

4,704,800

BOW SIGHT-MOUNTING AND ACCESSORY-MOUNTING APPARATUS

Robert E. Stinson, 7292 Peaceful Valley Rd., Acme, Mich. 49610

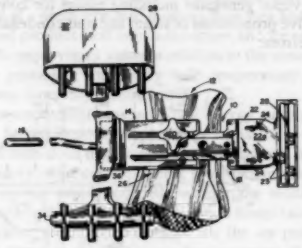
Filed Apr. 18, 1986, Ser. No. 853,678

Int. Cl.[4] F41G *1/46*; F41B *5/06*

U.S. Cl. 33—265 **14 Claims**

1. Accessory-mounting apparatus for archery bows, comprising in combination: a support base, and means for attaching said base to an archery bow in a fixed and generally permanent manner; a primary archery-accessory mounting member and means for adjustably carrying such member upon said support base, said means including position-fixing apparatus for securing the mounting member in a preselected position with respect to said support base and generally forwardly of a bow upon which such base is attached; said primary accessory-mounting member including an accessory-support and mounting portion comprising a forwardly-projecting element having a surface adapted to cooperatively receive the standardized mount for a standard archery bow sight, said surface carrying a predetermined array of mechanical fastener elements ar-

ranged in a portion complementary to that of the standardized mounting elements provided upon said standard archery bow sight mount; and at least one secondary archery-accessory-mounting member carried on said support base in mutually-spaced position with respect to said primary accessory-mounting member and positioned rearwardly of said bow, said secondary accessory-mounting member including means for at-



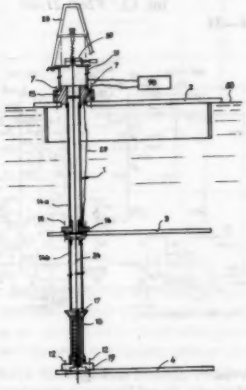
tachment thereto of a desired additional archery accessory device, whereby at least two different archery accessories may be securely mounted upon and carried by the same archery bow by use of a single mounting attachment thereto, and at least one such accessory is a standardized archery bow sight haing a standardized mount and said bow sight is rendered movably adjustable in position with respect to the bow.

4,704,801

DEVICE FOR CHECKING THE VERTICAL ALIGNMENT OF THE UPPER AND LOWER INTERNAL EQUIPMENT OF A PRESSURIZED WATER NUCLEAR REACTOR

Alain Frizot, Montcenis; Gerard Cadaureille, Saint Bonnet De Mure; Jean C. Lalére, Lyons, and Jean-Yves Machuron, Le Creusot, all of France, assignors to Framatome, Courbevoie, France

Filed Jul. 29, 1986, Ser. No. 890,431
Claims priority, application France, Aug. 2, 1985, 85 11901
Int. Cl.[4] G21C *17/00*
U.S. Cl. 33—502 **7 Claims**



1. Device for checking the vertical alignment of the upper internal equipment and of the lower internal equipment of a pressurized water nuclear reactor, these equipments being placed in the reactor vessel which is open and filled with water, the upper internal equipment comprising an upper plate (2) supporting the upper part of the guide tubes of the reactor, and a lower plate (3) which forms the upper core plate supporting the lower part of the guide tubes, and the lower internal equipment comprising the lower core plate (4) supporting the fuel assemblies, and the checking of alignment of the equipment being carried out with the fuel assemblies and at least some of the guide tubes in the upper internal equipment removed, which device comprises:

(a) a vertical tubular body (14) on which are fixed a first flange (15), at its upper end, provided with means (26) enabling it to be centered on a guide tube position on the upper plate (2) of the upper internal equipment, a lower end member (17) for centering at its other end, and a second, intermediate flange (16) equipped with means (52, 53) enabling it to be centered on a guide tube position on the upper core plate (3);

(b) means for receiving (65) the lower end member (17), fixed on the lower core plate (4), for placing said lower end member (17) in the center of an assembly bottom fitting, in the region of the lower core plate (4);

(c) a metal wire (24) placed substantially along the axis of the tubular support (14) and along its entire length, the lower end of which is fixed to the lower end of the end member (17) and the upper end of which is fixed to a fitting (20) which can move in at least two directions at 90° in the horizontal plane;

(d) means for determining accurately the movements of the movable fitting;

(e) four electrodes fixed to the intermediate flange (16) whose ends are arranged on two horizontal axes at 90° around the axis of the guide tube position on which the intermediate flange (16) is placed; and

(f) an electrical monitoring circuit (59, 90) which makes it possible to detect when the wire comes into successive contact with the four electrodes (60) when its upper end is moved by means of the movable fitting (20) in the direction of each of the electrodes (60) in succession.

4,704,802

TOOTH PROFILE SENSING INSTRUMENT

Therman B. Bennett, 1103 S. State Rte. 42, Lebanon, Ohio 45036

Filed Mar. 3, 1986, Ser. No. 835,365
Int. Cl.[4] G01B *5/18*
U.S. Cl. 33—556 **3 Claims**

1. A tooth profile sensing instrument for an elongate toothed corrugation roll having a peripheral surface portion made of magnetically attractable material and provided with elongate teeth in which each tooth is formed by a piar of valleys, the corrugation roll being adapted to operate in meshed relationship with another corrugation roll, as the two corrugation rolls rotate and corrugate strip material which moves between the corrugation rolls, comprising:

a sled, the sled including an elongate body, a pair of parallel spaced-apart elongate slide runners attached to the elongate body and extending therefrom, the elongate slide runners establishing a pair of substantially parallel planes extending downwardly from the elongate body, the elongate slide runners being adapted to be positioned within spaced-apart valleys of a toothed corrugation roll,

the elongate body of the sled being provided with a first opening therein which is positioned between the pair of slide runners,

an annular sleeve fixedly positioned within the first opening and attached to the elongate body of the sled,

a collar positioned within the sleeve and attached to the sleeve and rotatable with respect to the sleeve,

a housing attached to the collar,

a stem mounted within the collar and axially movable within the collar along a line substantially parallel to the planes of the slide runners, the stem having an engagement portion engageable with a tooth of a toothed roll as the slide runners are positioned within spaced-apart valleys of the toothed roll,

an indicator member carried by the housing and operably joined to the stem for operation in accordance with axial movement of the stem,

the elongate body of the sled also having a second opening therein between the slide runners, a magnet within the second opening and attached to elongate body of the sled and extending downwardly therefrom,

wherein the sled is slidably movable along the elongate roll as the elongate slide runners are positioned within spaced-apart valleys of the elongate roll and as the elongate slide runners slide along the valleys and within the valleys, and wherein the magnet is attracted toward the magnetically attractable surface portion of the toothed roll and urges the sled toward the surface portion of the toothed roll, and as the engagement portion of the stem engages a tooth shich is positioned between the valleys and as the engagement portion of the stem slides along the tooth, as the profile of the tooth is sensed with axial movement of the stem as indicated by the indicator member.

4,704,803

MULTI-ROLL WEB SUPPORT ARRANGEMENT

Jose E. Valentini, Hendersonville, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 25, 1986, Ser. No. 889,469
Int. Cl.[4] F26B *5/16*
U.S. Cl. 34—9 **15 Claims**

1. A method of reducing contamination of support rollers in web handling system in which a moving web has incompletely dried portions comprising the steps of:

passing the moving web over a support means comprising at least a first support means and a second supporting and blotting means,

determining when an incompletely dried portion of the moving web passes over the first support means, and

blotting the web by substituting a second supporting and blotting means for the first support means during the period the incompletely dried portion passes over the first support means.

4,704,804

METHOD OF AND APPARATUS FOR TEMPERATURE CONDITIONING OF MATTER

William G. Wyatt, Arlington, and Jack C. Page, Dallas, both of Tex., assignors to VE Holding Corp., Arlington, Tex.

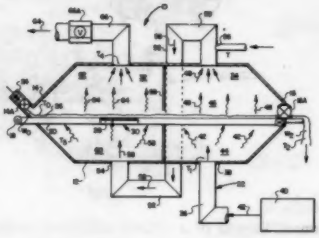
Filed Mar. 13, 1984, Ser. No. 589,260
Int. Cl.[4] F26B *5/04, 3/00, 21/06, 19/00*
U.S. Cl. 34—15 **82 Claims**

1. An improved system for temperature conditioning of matter of the type wherein matter to be conditioned is exposed to a vapor within a vessel for select conditioning wherein the improvement comprises

means for supplying a mixture of condensible and non-condensible gases and controlling the enthalpy, partial pressure and dew point thereof;

said mixture comprising steam and non-condensible gases and said means for controlling said enthalpy includes means for varying the energy input of said condensible and non-condensible gases;

said mixture supply means comprising a vapor generator of the type wherein burning of fuel and oxidant is effected, said vapor generator including means for controlling the relative proportions of steam and non-condensibles issuing therefrom;



said means for controlling said enthalpy including means associated with said vapor generator for varying the burning rate thereof;

said means for controlling said partial pressure and dew point of said mixture including means for controlling the pressure within said vessel;

means for delivering said gas mixture; and

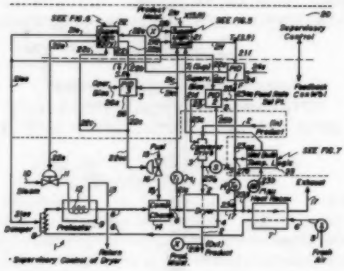
means for interaction between said gas mixture and said matter thereby controlling the temperature of said matter of approximate the dew point of said mixture.

4,704,805

SUPERVISORY CONTROL SYSTEM FOR CONTINUOUS DRYING

Azmi Kaya, Akron, and Larry Rice, Gates Mills, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 20, 1986, Ser. No. 921,917
Int. Cl.[4] F26B *21/06*
U.S. Cl. 34—31 **15 Claims**



1. Supervisory control arrangement system for controlling the operation of a dryer for the continuous drying of a moist solid product with a gaseous drying medium such as air for close control of the dried product moisture, which comprises:

temperature determining means for determining the wet bulb temperature of the medium in the dryer from the measurements of the prevailing outlet dry bulb temperature and outlet relative humidity of the medium in the dryer,

supervisory adjustment means for determining from the measurements of the prevailing inlet dry bulb temperature and outlet dry bulb temperature of the medium in the dryer and from the determined wet bulb temperature a supervisory value corresponding to the energy supply rate of the heating energy supply needed for heating the medium to an optimum inlet dry bulb temperature operating value for drying the product to a predetermined moisture content at a predetermined medium flow rate and a predetermined product feed rate to the dryer, and for producing from the supervisory value in relation to the measurement of the prevailing outlet dry bulb temperature a corresponding supervisory signal, and;

supervisory control means including energy supply control means for limiting the supervisory signal to a set point value which does not exceed a predetermined maximum supervisory value corresponding to a predetermined maximum energy supply rate for heating the medium to a predetermined maximum inlet dry bulb temperature operating value, and for producing from the set point value limited signal in relation to the measurement of the prevailing inlet dry bulb temperature a corresponding energy control signal for controlling the energy supply for heating the medium to an optimum inlet dry bulb temperature operating value which does not exceed said predetermined maximum operating value, whereby to prevent product scorching.

4,704,806

APPARATUS FOR DETERMINING THE TIMEWISE PROGRESS OF THE DRYING OF A MATERIAL SAMPLE

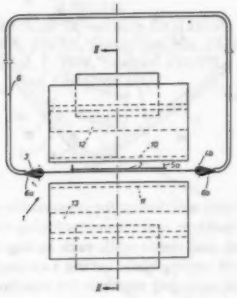
Harry Gresens, Benningen, Fed. Rep. of Germany, assignor to Bruckner Trockentechnik GmbH & Co. KG, Leonberg, Fed. Rep. of Germany

Filed Nov. 20, 1986, Ser. No. 932,668

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1986, 3602815

Int. Cl.[4] F26B *21/06*

U.S. Cl. 34—54 **13 Claims**



1. Apparatus for determining the timewise progress of the drying of a damp material sample (2), comprising means for producing a drying air stream of defined temperature, flow quantity and moisture content, a retaining device (3) for holding the material sample during the drying, a nozzle system (1) for delivering the drying air stream to the material sample held by the retaining device, and means for intermittently weighing the material sample wherein the improvement comprises a movable weight-sensing part (6) of the weighing means which is connected to support the retaining device (3) continually during the drying, and means (25) for intermittently interrupting the delivery of the drying air stream to the material sample in time with the intermittent weighing of the material sample.

4,704,807

TRAILER FOR STORING AND DRYING HARVESTED CROPS

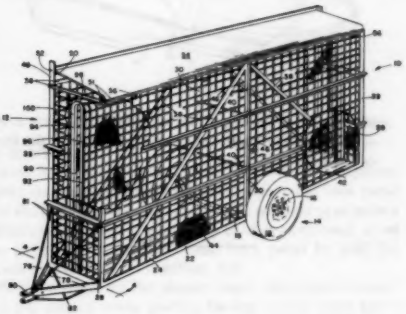
Steve H. Ridgway, Ridgway Farms, Rte. 1, Box 44R, Pleasanton, Tex. 78064

Continuation-in-part of Ser. No. 647,747, Sep. 6, 1984, Pat. No. 4,604,815. This application Jun. 18, 1986, Ser. No. 875,634

The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.

Int. Cl.[4] F26B *9/02*

U.S. Cl. 34—201 **11 Claims**



1. A trailer for storing and/or drying harvested crops, such as peanuts, comprising:

at least one front truck axle having tires on each end thereof;

a frame attached to a lower portion of said front truck axle, said frame being formed to give a long narrow deep rectangular box with smooth inner walls;

cattle panel wire attached to said smooth inner walls;

hardware cloth overlapping said cattle panel wire and attached thereto, said hardware cloth having sufficient strength to hold said crops inside said trailer and a small enough mesh to prevent said crops from spilling therethrough from said trailer, said cattle panel wire being of sufficient strength to support said hardware cloth;

at least two corner posts on one side of said frame extending above said trailer for supporting a cover thereon, said cover being extendable over said trailer;

hitch means attached at a lower front of said trailer;

gate means releasably secured at a lower rear of said trailer, said gate means also being covered with said cattle panel wire and said hardware cloth;

floor means with holes therein for allowing moisture and sand out and air in;

an inner longitudinal cage providing air space; and

width of said trailer being between 30" and 48".

4,704,808

SHOE HAVING A RIGID BACK PART AND FLEXIBLE FOREPART

William L. Bianchini, Elmwood, and Gary P. Duclos, Newburyport, both of Mass., assignors to Highland Import Corporation, Marlboro, Mass.

Filed Sep. 25, 1986, Ser. No. 911,370

Int. Cl.[4] A43B *1/10, 13/41, 23/08*

U.S. Cl. 36—102 **16 Claims**

1. A shoe comprising

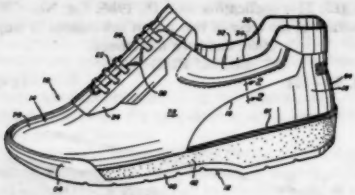
a sole having a forepart and a back part, said back part being relatively stiff and having a wide outwardly extending lasting margin extending about its periphery;

and an upper having a forepart and rear part,

a molded counter with a stiff outwardly extending flange and covered on the outside by the rear part, said rear part having a lower margin which extends outwardly over the

flange of the counter and is turned under the lasting margin of the back part of the sole;

stitching joining the lasting margin of the back part of the sole to the flange of the counter and the lower margin of the rear part overlying the flange,



said forepart of the upper having a margin which is turned under from the feather edge and is secured to the forepart of the sole.

4,704,809

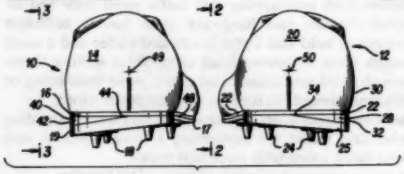
GOLF SHOE

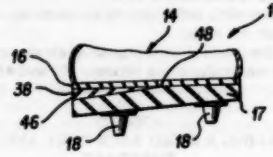
Paul S. Ballard, 4906 Carrollwood Meadows Dr., Tampa, Fla. 33625

Continuation-in-part of Ser. No. 867,202, May 27, 1986, abandoned. This application Jan. 23, 1987, Ser. No. 6,172

Int. Cl.[4] A43B *5/00*; A43C *15/00*; A63B *69/36*

U.S. Cl. 36—127 **12 Claims**





1. An improved golf shoe for assisting in the maintenance of proper weight distribution and shifting weight to the balls of the feet when worn during a golf swing, the improvement comprising:

a first wedge-shaped member carried by the sole of the golf shoe and a second wedge-shaped member carried by the heel of the golf shoe wherein the height of said first and second members is greatest along the edge of the shoe opposite the intended direction of travel of the golf ball to be struck and the wedge-shaped member extends across one-half or less of the width of the shoe from the center thereof to the outside edge of the shoe.

4,704,810

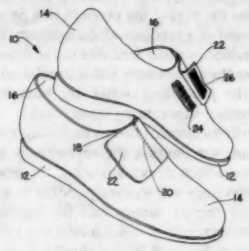
BOWLING SHOE PROTECTOR

James Massengale, 5181 Nighthawk Dr., Cincinnati, Ohio 45247

Filed Feb. 14, 1986, Ser. No. 829,169

Int. Cl.[4] A43B *3/16, 5/00*

U.S. Cl. 36—130 **8 Claims**



1. A bowling shoe protector comprising a flexible sole and a resilient upper portion, said sole and said upper portion capable of fitting snuggly around a bowling shoe, said sole being waterproof, said sole having a heel portion, an arch portion and a ball and toe portion, said ball and toe portions on said inner surface of said sole including a conditioning surface means for conditioning the exterior surface of a typical leather sole of a bowling shoe, said conditioning surface means comprising an abrasive surface, said surface being abrasive with respect to said exterior surface of the sole of said bowling shoe.

4,704,811

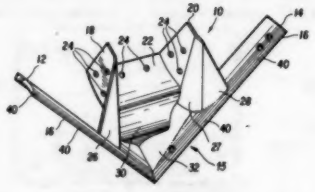
TRENCHING ATTACHMENT FOR A BACKHOE

Stuart T. Jefferson, Lorton, Va., assignor to Jefferson Development, Inc., Lorton, Va.

Filed Oct. 29, 1986, Ser. No. 924,430

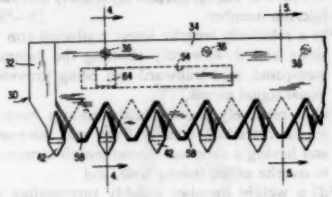
Int. Cl.[4] E02F *5/12*

U.S. Cl. 37—80 A **1 Claim**



1. A trenching attachment for removeable attachment to the bucket of a backhoe, said bucket including inside walls and an inside bottom, said inside walls each having a front edge, a V shaped ground cutting blade having a cutting edge for cutting the earth, side mounting members for attachment to said inside walls of the backhoe bucket, a bottom mounting member for attachment to said inside bottom of the backhoe bucket, said side and bottom mounting members being connected to form a channel, transition members for connecting the cutting blade to the channel formed by the side and bottom mounting members so that the plane of the cutting edge of said cutting blade is substantially parallel with the plane of the front edge of said backhoe bucket inside walls, and said cutting blade, mounting members and transition members forming a single trenching attachment to a backhoe bucket which when the blades are vertically disposed and the backhoe is moved forward a V shaped trench will be cut through the ground, depositing a berm at each side of the trench and when the blades are horizontally disposed said blades will collect the berm deposited by the trench cutting operation and replace it in the trench.

4,704,812
SCRAPER PAN WITH CUTTING BLADE
Alvie R. Paramore, Jr., Rte. 3, Box 433, Ozark, Ala. 36360
Filed Jul. 22, 1986, Ser. No. 887,896
Int. Cl.[4] E02F 3/40
U.S. Cl. 37—141 R 5 Claims



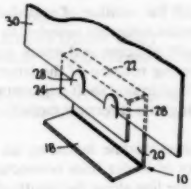
1. In a scraper pan type earth mover, an improved cutting blade assembly, comprising:

a fixed blade mountable on the forward edge of said scraper pan, said fixed blade having uniformly spaced, forwardly projecting tapered cutting teeth and guard teeth, said guard teeth being located at the apexes of said cutting teeth, said cutting and guard teeth being spaced from one another to define therebetween a continual, transversely extending channel;

a moveable blade received within said channel and having forwardly projecting cutting teeth adapted to overly said cutting teeth of said fixed blade; and

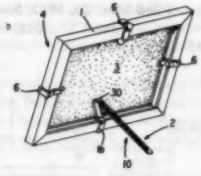
means for imparting reciprocating motion to said moveable blade.

4,704,813
MULTIPURPOSE SIGN HOLDER
Jacob Fast, 7561 NW. 9th St., Plantation, Fla. 33317
Filed Oct. 7, 1986, Ser. No. 916,372
Int. Cl.[4] G09F 3/18
U.S. Cl. 40—11 R 5 Claims



1. A holder for display cards which is formed of plastic sheet material configured to provide a pair of substantially parallel card holder panels, a bridging panel connecting the card holder panels into a channel-like configuration, a base-forming panel extending substantially perpendicularly from an edge of one of the card holder panels which is opposite the bridging panel and under the channel-like configuration to form a foot for supporting the holder in a free standing manner, and at least one card holder flap on at least one of the card holder panels opening towards the bridging panel, the holder being resiliently deformable for engaging the channel-like configuration over the rim of a container and the like.

4,704,814
PICTURE FRAME WITH TABLE TOP SUPPORT ELEMENT
Pietro Astolfi, Bologna, Italy, assignor to Pico-Glass S.p.A., Italy
Filed Jun. 25, 1985, Ser. No. 748,737
Int. Cl.[4] A47G 1/06
U.S. Cl. 40—152.1 3 Claims

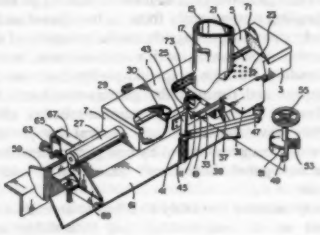


1. In combination:

a picture frame having a back panel, and a front transparent cover disposed adjacent to the back panel, the back panel and the front transparent cover being adapted to receive a picture therebetween, a plurality of clips positioned about the periphery of the cover and back panel to hold the cover and back panel together; and

a table top support for the picture frame, the support including a U-shaped lower portion having a front piece and a rear piece, the rear piece having a greater height than the front piece, the U-shaped lower portion being adapted to receive the front cover and back panel between the front and rear pieces, an inwardly sloped portion joined to and forming a well-defined angle with the rear piece of the U-shaped portion, the inwardly sloped portion extending towards the center of the back panel and engaging the back panel, and an extended portion joined to the inwardly sloped portion to define a pointed section extending towards the center of the back panel, the extended portion being disposed substantially at a right angle to the back panel of the frame, the back panel having a rear surface, and a plurality of incisions formed in the rear surface, and the pointed section having adapted to engage at least one of the incisions on the back panel.

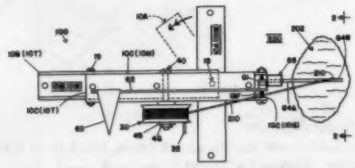
4,704,815
BAITING APPARATUS
Clovis Poirier; Marcel Banville; Mario McDonald; Sabin McDonald; Stephen Johnston, and Jean-Rene Masson, all of Sept-Iles, Canada, assignors to Ateliers Wood Inc., Canada
Filed Jan. 22, 1987, Ser. No. 6,053
Claims priority, application Canada, Jan. 23, 1986, 500185
Int. Cl.[4] A01K 97/00
U.S. Cl. 43—4 23 Claims



1. A baiting apparatus having a chute for feeding bait stock, a reciprocally moveable knife blade below the chute for slicing pieces of bait from the stock, a cam plate secured to operate

with the knife blade, a cam follower in operative association with the cam plate, a lever mechanism operable by the cam follower, and a retainer secured to the lever mechanism for retaining and gripping the sliced piece of bait.

4,704,816
ICE FISHING TIP-UP APPARATUS
Dennis W. Kuchar, Rural Rte. 2 (Box 200), Madison, Nebr. 68748
Filed Mar. 20, 1987, Ser. No. 28,220
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—17 **10 Claims**



1. Readily erectable, operationally reliable, and nestably transportable ice fishing tip-up apparatus comprising:

(A) three substantially identical and structurally interchangeable elongate channel members and alternatively designatable as an alpha-member, a beta-member, and a gamma-member, each channel member extending longitudinally between two ends including a fore-end and a rear-end and comprising:

(Aa) an elongate planar rectangular base-panel having a central-opening therethrough,

(Ab) a pair of elongate and transversely spaced planar side-panels coextensive along and extending perpendicularly upwardly from the two lengthwise extremities of said rectangular base-panel, said paired side-panels being perforated in transverse alignment more than once including a medial-perforations set located substantially midway the channel member ends and also including an endward-perforations set located nearer to a said channel end than to a medial-perforations set,

(Ac) a designatable alpha-member having its side-panels extending downwardly from its base-panel whereby said base-panel is elevatable above a laminar ice-crust by the side-panels thereof,

(Ad) a designatable beta-membr having its side-panels extending upwardly from its base-panel, the beta-member base-panel immediately adjacent to a channel end downwardly abutting a central portion of the alpha-member base-panel, and a first-pivot vertically passing through the alpha-member base-panel central-opening and the abutting base-panel of said overlying beta-member whereby said beta-panel is adapted to contact said laminar ice-crust at that end remote from the first pivot,

(Ae) a designatable gamma-member having its side-panels extending downwardly from its base-panel and respectively extending alongside medial portions of the beta-member side-panels, and a second-pivot horizontally extending through a medial-perforations set of beta-member and through the gamma-member side-panels whereby an end of said gamma-member channel is loftily elevatable above said vertical first-pivot, and

(Af) a stop member carried by said gamma-member below the base-panel thereof and remote from said second-pivot;

(B) a prop member pivotably attached to an endward-perforations set of beta-member and extendable upwardly therefrom to removably engage said stop member and establish a finite angular inclination for said gamma-member channel;

(C) a fishing line reel attached in flanking relationship to a medial portion of said gamma-member with a horizontally extending axle;

(D) a horizontally extending fulcrum member extending through an endward-perforations set of the elevatable end of said gamma-member; and

(F) an elongate lever member including:

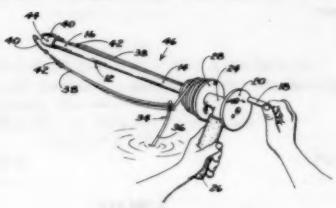
(Fa) a tubular medial-portion revolvably surrounding said fulcrum member,

(Fb) a relatively lengthy linear trailward-arm extending along and downwardly abutting the gamma-member base-panel, said trailward-arm being provided with a visual signal means,

(Fc) a relatively shorter leadward-arm having a first-length extending linearly from said fulcrum member and having a crooked second-length terminus adapted to overlie an ice fishing hole, and

(Fd) a weight member slidably surrounding said lever first-length.

4,704,817
TROTLINE REEL
Phillip R. Gibson, 223 N. Golden, Springfield, Mo. 64802, and Dean L. Richardson, Rte. 1, Box 26, Urbana, Mo. 65767
Filed Feb. 2, 1987, Ser. No. 10,179
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—57.3 **5 Claims**



1. A trotline reel assembly comprising in combination:

an elongated shaft of substantially uniform cross-section throughout and having a first end portion and a second end portion remote from said first end portion;

crank means fixedly connected to said first end portion of said shaft for rotation of said shaft;

handle means rotatably coupled to said first end portion of said shaft adjacent said crank means for supporting said shaft during rotation of the latter;

a flange fixed to said shaft adjacent to said handle means and extending in a direction radially outwardly of said shaft; and

an elongated trotline including an elongated major line, a plurality of leader lines connected at spread locations to said major line along the length of latter, and a plurality of fishing hooks each coupled to one of said leader lines,

said major line being wound directly on said shaft between said flange and said second end portion with said flange being operable to substantially prevent said line from becoming entangled with said handle means,

said second end portion of said shaft having an open end,

said hooks being directly received in said open end of said shaft as said major line is wound about said shaft,

said assembly presenting an open, unrestricted area between said wound major line and said open end of said shaft for receiving said leader lines and facilitating insertion of said hooks in said open end of said shaft regardless of the spacing of leader lines along the length of said major line.

4,704,818

HYDROPONIC GROWING SYSTEM AND STACKABLE MODULAR COMPONENTS THEREOF

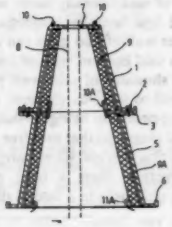
Murray C. Cameron, 766 George Street, Dunedin, New Zealand

Filed Feb. 5, 1986, Ser. No. 826,335

Claims priority, application New Zealand, Feb. 13, 1985, 211107

Int. Cl.[4] A01G *31/00*

U.S. Cl. 47—62 **15 Claims**



1. A hydroponic planter comprising:

a plurality of stacked frusto-conical shaped shell members having shell-like walls;

a plurality of openings in said walls of each shell member through which plants can grow;

a plurality of hollow, frusto-conical shaped matrices of rooting material stacked to form a frustoconical assembly having an uppermost and a lowermost matrix in substantially close relationship within said stacked shell members so that plants inserted through said openings can enter into a root-fixing relationship in said rooting material and each matrix, except the lowermost matrix, is in a liquid-transferring relationship under gravity with an adjacent matrix, the overall configuration of each matrix being substantially similar to the overall configuration of said shell members adjacent thereto;

at least one anchoring means at the top and at least one anchoring means at the bottom of each matrix for anchoring each matrix to an adjacent matrix;

liquid nutrient dispensing means for dispensing liquid nutrient into said rooting material adjacent an upper extremity of the matrix within the uppermost shell member; and

liquid collection means disposed below the lowermost shell member to collect excess liquid nutrient passing through the rooting material.

4,704,819

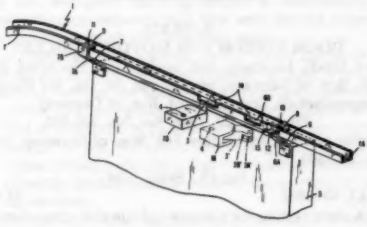
FLAT SLIDING DOOR UNIT

Yosiji Tutikawa, Hiranonishi 3-7-20, Hirano-ku 547, Osaka, Japan

Filed Apr. 25, 1986, Ser. No. 856,932

Int. Cl.[4] E05D *15/20*

U.S. Cl. 49—129 **6 Claims**



1. A flat sliding door unit in which a first sliding door lying in a closure position on a same vertical flat plane as that of an adjacent structure is shifted to a front side of said adjacent structure, comprising:

a main rail extending along an upper door frame;

a swing arm pivotally mounted adjacent said main rail and supported by said upper door frame;

said sliding door being provided with a pair of rollers rolling along said main rail and respectively secured to the upper end of the sliding door, one of said rollers being mounted to a roller stay having an upper stay end projecting above the upper end of said door, said upper stay end further including a hook having a first surface forming a recess with said upper stay end, said recess facing towards the swing arm and a second surface facing in the opening direction of said door,

said swing arm being provided with an engaging pin at a tip thereof, said tip being formed with a pair of upper and lower extension arms between which said engaging pin extends, said tip further including a stop surface formed between said arms,

said hook detachably engaging said engaging pin to retain the door in the closure position with said pin disposed within the recess and said swing arm pivoted into a first position away from the main rail, initial movement of the door causing pivoting of the swing arm towards the main rail through a predetermined angle and retention of the pin in the recess caused by contact between the stop surface and second hook surface during pivotal movement of the swing arm until said swing arm pivots through said predetermined angle to shift the roller onto the main rail for sliding movement of the door to an open position.

4,704,820

DOOR GLASS RUN FOR AUTOMOBILES

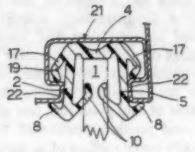
Hisayuki Kisanuki, Ichinomiya, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed May 22, 1986, Ser. No. 865,834

Claims priority, application Japan, May 22, 1985, 60-75970[U]

Int. Cl.[4] E06B *7/16*

U.S. Cl. 49—441 **12 Claims**



1. An improved door glass run for assembly with an automotive door glass run channel including a laterally inner wall, a laterally outer wall spaced laterally from said laterally inner wall and in confronting relationship therewith, and a bottom wall extending between said laterally inner and laterally outer walls so as to define therewith a generally U-shaped groove having an opening between said laterally inner and outer walls remote from said bottom wall, said laterally inner and outer walls adjacent said opening being provided with wall portions which project towards one another but remain gapped from one another for effectively partially constructing said opening so as to provide respective internal shoulders which are disposed in longitudinally spaced confronting relationship with said bottom wall internally of said U-shaped groove and so as to provide respective external shoulders which are disposed in a longitudinally opposite direction to said internal shoulders on laterally opposite sides of said opening,

said improved glass run being integrally formed of resilient material and comprising:

a laterally inner wall, a laterally outer wall spaced laterally from said laterally inner wall and in confronting

relationship therewith, and a bottom wall extending between said laterally inner and outer walls of said glass run so as to define a generally U-shaped groove having an opening between said laterally inner and outer walls of said glass run remote from said bottom wall of said glass run;

a laterally projecting pulling-proof lip formed externally on said laterally inner wall of said glass run, so as to have a free end;

a laterally projecting cover lip formed externally on said laterally inner wall of said glass run, so as to have a free end;

said pulling-proof lip of said laterally inner wall of said glass run being based on this laterally inner wall at a location which is closer to said bottom wall of said glass run than is a location where said cover lip of said laterally inner wall of said glass run is based on this laterally inner wall;

respective longitudinally spaced confronting shoulders formed on said pulling-proof lip and said cover lip of said laterally inner wall of said glass run, these shoulders being spaced longitudinally apart, when said glass run is in a free state and undistorted by contact with said run channel, by a distance which is at least slightly less than the distance between said internal and external shoulders on said laterally inner wall of said run channel;

said pulling-proof lip and said cover lip of said laterally inner wall of said glass run projecting obliquely towards one another as they project laterally from said laterally inner wall of said glass run;

a first laterally projecting portion formed externally on said laterally outer wall of said glass run, so as to have a free end;

a second laterally projecting portion formed externally on said laterally outer wall of said glass run, so as to have a free end;

said first laterally projecting portion of said laterally outer wall of said glass run being based on this laterally outer wall at a location which is closer to said bottom wall of said glass run than is a location where said second laterally projection portion of said laterally outer wall of said glass run is based on this laterally outer wall;

respective longitudinally spaced confronting shoulders formed on said first and second laterally projecting portions of said laterally outer wall of said glass run;

a glass-pushing lip based on said laterally inner wall of said glass run adjacent said opening into said U-shaped channel of said glass run, this glass-pushing lip having a free end portion positioned for slidingly engaging a laterally inner surface of an automotive door glass sheet when such sheet is slid longitudinally into and out of said U-shaped channel of said glass run;

a glass-pushing lip based on said laterally outer wall of said glass run adjacent said opening into said U-shaped channel of said glass run, this glass-pushing lip having a free end portion positioned for slidingly engaging a laterally outer surface of said automotive door glass sheet when such sheet is slid longitudinally into and out of said U-shaped channel of said glass run;

said shoulders on said pulling-proof lip and said cover lip of said laterally inner wall of said glass run being positioned on said laterally inner wall of said glass run to receive longitudinally between them said internal and external shoulders of said wall portion of said laterally inner wall of said run channel;

said shoulders on said first and second laterally projecting portions of said laterally outer wall of said glass run being positioned on said laterally outer wall of said glass run to receive longitudinally between them said internal and external shoulders of said wall portion of said laterally outer wall of said run channel;

said free ends of said pulling-proof lip and said first laterally projecting portion of said laterally inner and outer walls of said glass run, when said glass run is in a free state and undistorted by contact with said run channel being disposed further apart in a transverse direction than the width of said opening of said U-shaped groove of said run channel as partially constricted by said wall portions which project towards one another, so that at least said pulling-proof lip of said glass run must be resiliently flexed in order to pushingly install said glass run into said run channel so that said pulling-proof lip is located longitudinally between said bottom wall of said run channel and said internal shoulder of said wall portion of said laterally inner wall of said run channel and said first laterally projecting portion of said laterally outer wall of said glass run is located longitudinally between said bottom wall of said run channel and said internal shoulder of said wall portion of said laterally outer wall of said run channel; and

said pulling-proof lip being V-shaped in transverse cross-sectional shape, so that said free end thereof is provided on a portion thereof which projects obliquely in a medial direction from a base portion thereof which projects obliquely in a lateral direction.

4,704,821

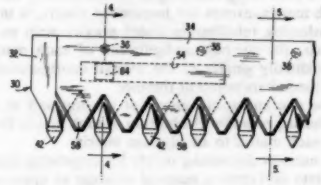
COMPRESSION SEALS IN A DOUBLE HUNG STYLE WINDOW

Lawrence Berndt, P.O. Box 211, Harrington Rd., Cornish, N.H.

Filed Jul. 3, 1986, Ser. No. 881,912

Int. Cl.[4] E05F *1/00*; E05D *15/10*

U.S. Cl. 49—446 **4 Claims**



1. A window assembly comprising a frame; an upper sash; a moveable sash assembly comprising a moveable lower sash having a first face facing said upper sash and a second face facing away from said first face, and a balance removably connected to said lower sash, said balance having means for gripping said frame, said gripping means facing away from said first face; a stop below said upper sash to support weatherstripping; continuous weatherstripping mounted in said stop; and means for moving said lower sash laterally against said weatherstripping to compress it only when the window is closed.

4,704,822

DOOR SYSTEM FOR MOTOR VEHICLES

Rainer Srock, Leonberg, and Georg Eger, Hochdorf, both of Fed. Rep. of Germany, assignors to Dr. Ing. hcf Porshe Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Oct. 20, 1986, Ser. No. 920,455

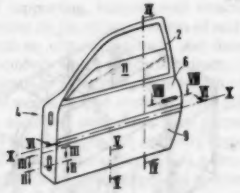
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1985, 3537303

Int. Cl.[4] B60J *5/04*

U.S. Cl. 49—502 **33 Claims**

1. A door system for a motor vehicle that comprises essentially a basic frame with an interior part and an exterior part of the door, between which, at a cross member connected with the basic frame, installation aggregates are held, the door parts

being constructed for receiving hinges and a lock, characterized by a first subassembly of the door that comprises a preassembled basic body consisting of carriers and column parts, the individual parts of said basic body being connected with one another in a self-supporting way and forming an open one-piece bearing structure that is open to the interior and exterior



side of the door for the mounting of installed aggregate parts located on the inside, and wherein this bearing structure, by means of a second detachably fastened subassembly that consists of an interior part of the door and a lower exterior part of the door is enclosed in an encapsulating way on the exterior and on the interior side.

4,704,823

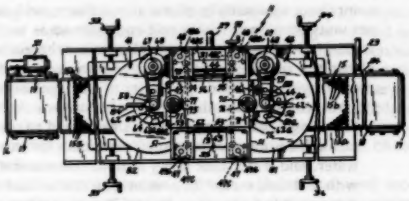
ABRASIVE SURFACING MACHINE

Clarence I. Steinback, Edina, Minn., assignor to Acrometal Products, Inc., Minneapolis, Minn.

Continuation of Ser. No. 645,913, Aug. 29, 1984, abandoned. This application Sep. 2, 1986, Ser. No. 901,973

Int. Cl.[4] B24B *9/00*

U.S. Cl. 51—110 **30 Claims**



1. Apparatus for deburring workpieces, including relatively small parts, comprising:

frame means;

workpiece conveyor means carried by the frame means for simultaneously carrying a plurality of individual workpieces thereon for movement through a deburring area, the workpiece conveyor means comprising an endless, substantially planar workpiece carrying surface of predetermined width defined by first and second longitudinal side edges, the workpiece conveyor means further comprising means for retaining workpieces having a dimension less than said predetermined width in a fixed position on said workpiece carrying surface at substantially any point thereon between said first and second edges for movement through the deburring area;

and a deburring head carried by the frame means in said deburring area in opposed relation to said workpiece carrying surface, the abrasive surfacing head comprising

rotatable disk means having a substantially planar surface that is substantially parallel to the workpiece carrying surface of the workpiece conveying means, said disk means having a diameter that is at least substantially 1½ times the predetermined width of the workpiece carrying surface;

and a resilient deburring medium of substantially uniform thickness secured to the planar surface of the disk means, the resilient deburring medium being sized and configured to present to workpieces as it is rotated a resilient deburring surface having a diameter that is at least substantially 1½ times the width of the workpiece carrying surface, whereby each workpiece is engaged multidirectionally by the resilient deburring medium irrespective of its fixed position on the workpiece carrying surface.

4,704,824

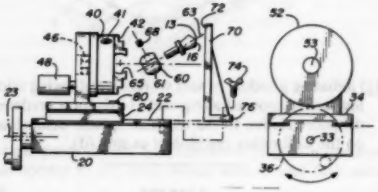
PUNCH TOOL GRINDER AND METHOD

Tommy D. Horner, 3440 N. Beltline Rd., No. 1066, Irving, Tex. 75062

Division of Ser. No. 718,961, Apr. 5, 1985, Pat. No. 4,656,786. This application Sep. 18, 1986, Ser. No. 909,121

Int. Cl.[4] B24B *1/00*

U.S. Cl. 51—281 R **4 Claims**



1. A method of aligning a punch tool for grinding a surface thereof on a grinding machine of the type having two perpendicular guideways with a rotatable chuck slidably mounted on a first one of said guideways and with a motor-driven grinding wheel mounted on a second one of said perpendicular guideways for slidable movement in the direction of the axis of rotation of said grinding wheel parallel to said second guideway, said method for aligning comprises the steps as follows:

(a) releasably holding said surface of said punch tool to be ground perpendicular to the axis of rotation of said rotatable chuck and parallel to the direction of slidable movement of said grinding wheel;

(b) clamping said punch tool in said chuck so that said surface remains in said releasably held position; and

(c) releasing said releasably held surface of said punch tool so that said tool remains clamped in said chuck and said punch tool surface can be brought in contact with said grinding wheel.

4,704,825

METHOD FOR AUTOMATICALLY SIZING A GROUND SURFACE ON A WORKPIECE

Wayne R. Moore, Trumbull, Conn., assignor to Moore Special Tool Co., Inc., Bridgeport, Conn.

Filed Sep. 2, 1986, Ser. No. 902,889

Int. Cl.[4] B24B *1/00*

U.S. Cl. 51—290 **5 Claims**

1. A method for automatically sizing a ground surface on a workpiece comprising the steps of:

(a) providing a detector having a reference edge in proximity to a substantially cylindrical grinding tool mounted for independent movement along a linear U-axis relative to the centerline of a rotatable machine spindle;

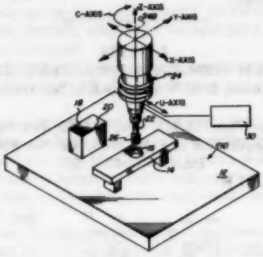
(b) positioning the centerline of said machine spindle a known distance from said detector edge;

(c) moving said grinding tool along said U-axis so that the outermost cutting position of said grinding tool is detected by the reference edge position of said detector;

(d) calibrating the position of said grinding tool relative to the position of the machine spindle centerline by recording the grinding tool position along said U-axis upon detection of said outermost cutting position by said detector;

(e) moving said spindle centerline so that it is centered in plan evaluation along the radius to be ground;

(f) positioning said grinding surface of said tool against a surface on a workpiece to be ground; and



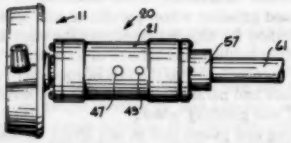
(g) initiating grinding of said workpiece allowing said grinding tool to proceed along said U-axis for a predetermined distance relative to the machine spindle centerline based on the calibration established at step (d).

4,704,826

SPIN-BLAST TOOL

Wyatt S. Kirkland, 1536 Chanticleer Ave., Santa Cruz, Calif. 95062

Filed Jun. 26, 1981, Ser. No. 277,813
Int. Cl.[4] B24C *3/06*
U.S. Cl. 51—411 **2 Claims**



1. In a pipe spin-blast tool having a tubular handle with inflow and outflow ends and a spinning jet head connected to the outflow end, the improved handle construction comprising,

tubular, coaxial inner and outer pipes having opposite inflow and outflow ends with sealed annular bearings coaxially mounted at said opposite ends, sealing the annular space therebetween forming a plenum, the inside of the inner pipe remaining clear for transmitting a sand-air blast, the bearings having inner and outer races with the outer races being fixed relative to the outer pipe and the inner races being fixed relative to the inner pipe so that the inner pipe may rotate while the outer pipe is stationary, said plenum containing a viscous fluid,

a plurality of vanes radially extending outwardly from the inner pipe into said viscous fluid forming a tortuous path for motion of said viscous fluid whereby rotation of the inner pipe is slowed by resistance of said viscous fluid to motion of said vanes therein, said vanes having a lengthwise alignment parallel to the axis of the pipes,

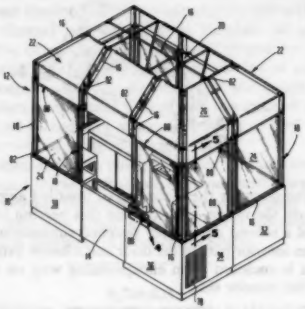
flange means for connecting a sand-air blast supply pipe to the inside of the inner pipe at the inflow end thereof for activating a spinning jet head connected to the outflow end, wherein said flange means is spaced from the inner bearing race by a shaft seal, said inner pipe defining a notch in the outer peripheral surface beneath said inner bearing race for slowly leaking viscous fluid from said plenum to lubricate said shaft seal.

4,704,827

MODULAR BOOTH STRUCTURE

Michael Murphy, and Henry Belszek, both of Columbus, Ohio, assignors to National Icee Corporation, Philadelphia, Pa.

Filed May 1, 1986, Ser. No. 858,344
Int. Cl.[4] A47K *3/16*
U.S. Cl. 52—34 **8 Claims**



1. A modular booth structure for use in merchandising food and drink items comprising a cover portion and a base portion supporting said cover portion,

(a) said base portion comprising a plurality of vertical panels interconnected edge to edge to form a substantially rectangular enclosure, one of said vertical panels being hinged to an adjacent panel to form a door in said enclosure;

(1) a plurality of cabinet units within said enclosure and comprising substantially planar top surfaces, said cabinet units positioned within said enclosure so as to abut an inside surface of said vertical panels, wherein said planar top surfaces of said cabinets form a substantial counter within an inside perimeter of said enclosure;

(i) wherein said plurality of cabinet units include a plumbing system comprising: a sink affixed to one of said cabinet units; at least one water tank for storing water, said water tank being in fluid communication with said sink; means for pressurizing said at least one water tank to force water from said water tank to said sink; and means for collecting and holding waste water discharged from said sink;

(ii) said plurality of cabinet units further comprising at least one water tank adapted for use with a beverage dispenser; means for pressurizing said at least one water tank to force water from said tank to a beverage dispenser; and a carbon dioxide tank adapted for use with a beverage dispenser, said carbon dioxide tank comprising means for storing and delivering carbon dioxide to a beverage dispenser;

(b) said cover portion comprising a plurality of pipes connected together to form a lattice structure, said lattice structure comprising:

(1) a vertical component affixed to said vertical panels of said base portion so as to form a substantially vertical extension of said vertical panels; and

(2) a horizontal component disposed across an upper end of said vertical component.

4,704,828

SNAP TOGETHER WINDOW WELL

Melvin T. Kemp, 1661 N. Sweetwater La., Farmington, Utah 84025

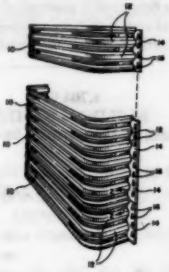
Filed Aug. 11, 1986, Ser. No. 872,229
Int. Cl.[4] E04F *17/06*; E06B *5/02*
U.S. Cl. 52—107 **5 Claims**

1. A window well structure which is to be disposed below

the adjoining soil grade adjacent to a window opening in a building wall, said window well structure comprising

at least two superposed u-shaped sections made of sheet metal; and

engagement means on adjacent edges of said superposed, u-shaped sections which securely interengage each other to unite the adjacent, superposed, u-shaped sections as a unitary, self supporting, integral well structure, said engagement means on the adjacent edges of said superposed, u-shaped sections comprising male and female type engagement members which are formed integrally with and extend substantially along the entire length of the respective edges of said u-shaped sections, with said male type engagement members comprising flat, ribbon-like, elongate sections formed along the mutually respective entire lengths of respective one edges of said u-shaped sections, and with said female type engagement members comprising bent back sections formed along the mutually respective entire lengths of respective other edges of said u-shaped sections such that the respective bent back sections form open u-shaped channels, and further with said female type engagement members in addition comprising sharply bent lips formed along the mutually respective free edges of the bent back sections so that said lips extend downwardly and inwardly into the respective u-shaped channels,



whereby interengagement between adjacent u-shaped sections is achieved by said male type engagement members being received within said female type engagement members of adjacent u-shaped members, such that said lips on said female engagement members make firm, interlocking, gripping engagement with said male type engagement members along the entire length of said male type engagement members.

4,704,829

BUILDING TRUSS CLAMP DEVICES

Andrew J. Baumker, Jr., 2152 S. Jenkins Ave., Ft. Pierce, Fla. 33451

Filed Feb. 27, 1987, Ser. No. 19,742
Int. Cl.[4] E04C *3/11*
U.S. Cl. 52—127.2 **5 Claims**

1. A clamp device to hold building trusses in place after the trusses have been deposited upon a building foundation by a crane and while they are being nailed to stabilize their position prior to application of building panels thereto which comprises:

a pair of substantially identical first U-shaped strip members defined by a longitudinal base portion and a lateral portion at each end thereof,

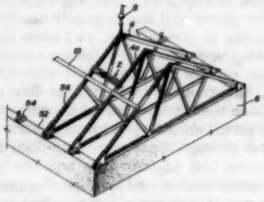
said first members being positioned spaced apart parallel to one another with their said lateral portions at each end being aligned with each other,

spaced apart cross-ties fixing said first members in said position,

a second U-shaped strip member similar in configuration to said first members,

said second member captured between said first members by said cross-ties to move parallel thereto with the lateral portions of said second member projecting from the same side of said device as said lateral portions of said first members,

lateral posts extending laterally of each of said first members and said second member from the sides thereof opposite to their lateral portions,



said lateral posts of said first members lying in a common plane normal to the longitudinal axes of said first members,

said lateral post of said second member being spaced apart from said lateral posts of said first members,

a lever arm having a free end and a captured end, said lever arm being pivoted adjacent said captured end on a shaft that extends between said lateral posts of said first members, and

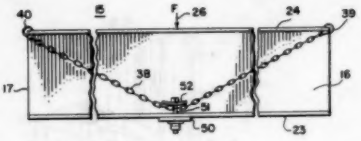
a pair of cam elements pivoted at one end to the captured end of said lever arm and at the other end to said lateral post of said second member.

4,704,830

INCREASING THE LOAD CARRYING CAPACITY OF BEAMS

Charles R. Magadini, 6024 No. 20th St., Phoenix, Ariz. 85016

Filed Feb. 6, 1986, Ser. No. 826,831
Int. Cl.[4] E04C *3/10*
U.S. Cl. 52—226 **17 Claims**



1. The method of reworking a structure for increasing the load bearing capacity of an I-beam built thereinto and covered by parts of the structure, the I-beam having a web member from which extends an upper flange in contact with a downwardly directed load and a lower flange supported at two ends to bear the load, which I-beam has an associated end to end cavity available along the web member between the flanges, the method comprising:

obtaining access to the two I-beam ends by removing parts of the structure covering the ends,

obtaining access to the I-beam cavity and to at least one load bearing position on the lower flange intermediate the ends by removing parts of the structure covering that position,

stringing a flexible, tension bearing longitudinal member through the cavity alongside at least one side of the I-beam web member from one end to the other of the I-beam,

attaching ends of the longitudinal member in tension bearing

capacity to the upper flange portion of the I-beam at each end thereof,

connecting an intermediate portion of the attached longitudinal member with the I-beam lower flange at the load bearing position, and

placing the longitudinal member in tension between the I-beam ends and the intermediate lower flange position, thereby sharing and supplementing the load bearing capacity of the I-beam.

9. A strengthened I-beam girder forming part of a previously-built structure in which the girder was originally installed, and having an increased load carrying capacity as compared with the same girder as it was originally installed in the structure, comprising in combination, an I-beam including a web member having upper and lower flanges extending therefrom between two ends of the beam, said web member being a continuous, uninterrupted web member free of openings, a flexible, tension bearing longitudinal member that is manually bendable to permit threading and manipulation of the longitudinal member through a passageway defined by a space between the beam and adjacent trim and finish portions of a building structure and around building elements positioned in the space to permit the longitudinal members to be attached to the beam after the beam has been enclosed by trim and finish portions of a building structure, the longitudinal member positioned alongside the web member from end to end and attached to and extending between both ends of the beam near the upper flange, the longitudinal member connected at a single intermediate position with the lower flange and being in a load bearing tension relationship between the intermediate position and the ends, and tensioning means carried at the intermediate position for tensioning the longitudinal member to share a beam load bearing on the upper flange of the beam, said tensioning means being adjustable to carry the tension in the flexible member between the intermediate position and the ends.

4,704,831

FACADE WALL

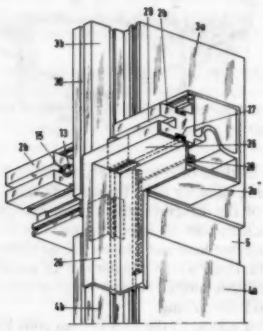
Hans Emmer, Liestal, Switzerland, assignor to Eltreva AG, Aesch, Switzerland

Filed Nov. 3, 1986, Ser. No. 925,944

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1985, 3539002

Int. Cl.[4] E04B *2/88*

U.S. Cl. 52—235 **12 Claims**



1. A facade wall with a loadbearing skeleton of vertical posts and cross members inserted between said posts and connected at right angles thereto, said posts and cross members together forming skeleton panels, provided with a seal, for receiving one plate element each, said posts having a profile comprising in cross-section a room-side box profile portion and a weather-side head profile portion of smaller width and having a vertically extending seal retaining groove in a weather-side box profile surface on either side of the head profile portion, while in the cross member there are provided on the weather side a lower horizontal seal retaining groove and an upper horizontal seal retaining groove, wherein,

(a) the cross member profile comprises a box profile portion and a head profile portion, said head profile portion being arranged between said horizontal seal retaining grooves and having in its upper side and in its lower side a horizontal seal retaining groove aligned with a vertical seal retaining groove in an associated side surface of a head profile portion of the post profile; and

(b) extending around a skeleton panel is a sealing profile, having a first retaining foot engaged in the lower or upper seal retaining groove in the head profile portion of the cross member and in the vertical seal retaining grooves in the side surfaces of the head profile portions of the two post profiles, said sealing profile further having a second retaining foot engaged in the lower or upper seal retaining groove in the box profile portion of the cross member and in the vertical seal retaining grooves of the weather-side box profile surfaces of the two post profiles.

4,704,832

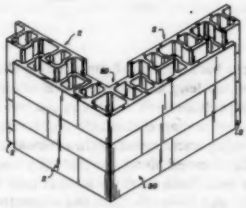
BUILDING SYSTEM

Theodor Vassiliadis, 1736 Amphion Street, Victoria, Canada V8R 4Z7

Filed May 20, 1986, Ser. No. 865,355

Int. Cl.[4] E04B *1/02*

U.S. Cl. 52—279 **12 Claims**



1. A building unit combination comprising:

a building block interlocked with a building block end unit, the building block being able to interlock with a further, similar building block, the building block end unit of the combination comprising:

a wall portion having a flat outer surface, an inner surface and a predetermined width;

a flat end surface;

a first hollow projection extending from the inner surface of the wall portion, the projection comprising a narrow portion adjacent the inner surface and a wider portion extending from the narrow portion;

a second hollow projection extending from the inner wall and defined at one side by the flat end surface of the end unit, and at the other side by a wall remote from the end wall and comprising a first web extending outwardly from the inner surface of the wall portion and a second web, attached to the first web, and spaced further from the end surface than the first web;

a recess formed on the second projection, remote from the outer surface of the wall portion and the flat end surface and comprising a first surface, generally parallel to the inner surface of the wall portion and an end surface, generally parallel to the end wall;

a space defined between said first and second projections;

the building block comprising a wall portion having a flat outer surface, an inner surface and a predetermined width equal to the predetermined width of the end unit;

at least one hollow projection extending from the inner surface of the wall portion, corresponding to the first projection on the end unit, and comprising a narrow portion adjacent the inner surface of the wall portion and a wider portion extending from the narrow portion, said at least one hollow projection engaging the space defined between the first and second projections of the end unit to interlock said building block and said end unit, the width of the wide portion being substantially equal to the distance between the narrow portion of the first projection of the end unit and the first web of the second projection and the width of the narrow portion being substantially equal to the distance between the wide portion of the first projection and the second web of the second projection;

the wall portion having an extension at each end extending beyond the said at least one hollow projection of the building block by an amount substantially equal to half the width of a wider portion; and

the recess of the corner unit receiving one said wall portion extension of the building block.

4,704,833

PREFORMED SOFFITS FOR INTERIOR CONSTRUCTION

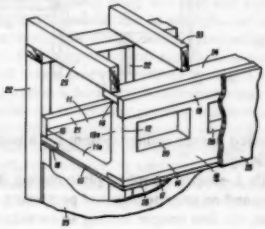
Richard W. Bear, Cedar Rapids, Iowa, assignor to Epsco, Inc., Cedar Rapids, Iowa

Filed Aug. 18, 1986, Ser. No. 897,202

The portion of the term of this patent subsequent to Apr. 29, 2003, has been disclaimed.

Int. Cl.[4] E04C *1/00*

U.S. Cl. 52—309.2 **6 Claims**



1. A preformed, composite soffit comprising: a length of molded material having a pair of legs to provide a soffit of generally L-shaped configuration in cross-section, the legs having a pair of exterior first planar surfaces at substantially right angles to each other and forming the outer faces of the legs and the soffit, the juncture between said first pair of planar surfaces constituting a first exterior longitudinal corner of the soffit and being formed by a furring strip, exterior surfaces of said furring strip forming portions of said first surfaces; a pair of exterior second planar surfaces extending transversely of respective ones of the first surfaces and forming the longitudinal outer end faces of the legs and the soffit, the junctures between respective ones of said first and second pairs of planar surfaces constituting second and third exterior longitudinal corners of the soffit, at least one of said second and third exterior longitudinal corners being formed by another furring strip, exterior surfaces of said other furring strip forming portions of said first and second surfaces of one of the legs; the furring strips extending the length of the soffit and secured to said material.

4,704,834

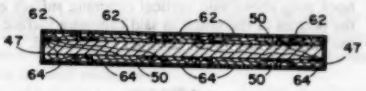
RAISED PANEL-STYLE DOOR

Terry A. Turner, Rte. 2, Box 424, Prineville, Oreg. 97754

Filed Nov. 24, 1986, Ser. No. 934,344

Int. Cl.[4] E04C *1/00*; E04F *13/10*; E06B *3/00*; B32B *3/10*

U.S. Cl. 52—311 **11 Claims**



1. A raised panel-style door comprising:

a support panel having a planar veneer-support surface extending over one face thereof, said panel further having a plurality of channels interrupting and recessed inwardly from said surface, each channel extending in a rectangular course,

decorative wood inlay strips inlaid within each channel, said strips having recessed surfaces interposing marginal planar surfaces, said marginal planar surfaces abutting and being substantially coplanar with said veneer-support surface of said panel, means adhering said strips to said panel,

a veneer of decorative wood overlaying said panel surface and said marginal planar surfaces of said strips with interruption so as to leave exposed said recessed surfaces of the strips, and

means adhering said veneer to said support panel.

4,704,835

HOOK STRIP FOR REMOVABLE WALL PANELS

Lamar Jordan, 20550 Maybank, Dallas, Tex. 75220

Filed Sep. 30, 1985, Ser. No. 781,430

Int. Cl.[4] E04B *2/58, 1/56*

U.S. Cl. 52—486 **4 Claims**

1. In removable partition systems of the type embodying top and bottom tracks enclosing a plurality of channel shaped vertical studs having panel notches defined in their sides and vertical wall panels secured to said channel shaped studs by means of the panel notches, the improvement comprising:

(A) a hook strip secured to the inner face of the wall panels adjacent the vertical edges of said wall panels, said hook strip further including;

(i) a hardened planar surface;

(ii) a downwardly extending hook offset with respect to the leading edge of said planar surface and dimensioned so as to extend through the notch within said channel shaped stud; said hook further including:

(a) a downwardly inclined upper edge, so as to complementally engage the upper edge of the notch within the channel shaped stud, as said hook is being extended through and set within the notch;

(b) an upwardly inclined lower edge so as to be engage-

able complementally with the panel notch in said channel shaped stud;

(iii) a vertical camming surface protruding inwardly beyond said inclined lower edge such that the hook extends complementally through said notch and said camming surface resiliently and complementally engages the inner surface of the channel shaped stud beneath the notch; and

(iv) a horizontal bight extending between said hook and said hook strip above said vertical camming surface engaging the bottom of the notch as said camming surface engages the inner surface of the channel shaped stud.

4,704,836

SPACE FRAMES

Edwin T. Codd, Brisbane, Australia, assignor to Tulserate Limited, London, England

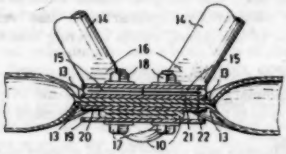
PCT No. PCT/AU85/00114, § 371 Date Jan. 23, 1986, § 102(e) Date Jan. 23, 1986, PCT Pub. No. WO85/05650, PCT Pub. Date Dec. 19, 1985

PCT Filed May 30, 1985, Ser. No. 829,658

Claims priority, application Australia, May 31, 1984, PG5295

Int. Cl.[4] E04B *1/19, 1/58*

U.S. Cl. 52—650 **10 Claims**



1. A space frame of the type having upper and lower grids of tubular longitudinal and lateral chord members, and tubular oblique struts with attachment pads at their ends interconnecting nodes at chord intersections of the two grids wherein, at each node:

the chord members have flattened sections in sumperimposed relationship,

strut attachment pads are flattened to form shoulders adjacent ot the pad and are secured, in adjacent substantially co-planar relationship, to the superimposed flattened chord sections,

load distribution plates are provided disposed above and below the assembly of adjacent strut attachment pads and superimposed flattened chord sections, the distribution plate secured to said attachment pads having side edges which bear against said shoulders,

the chord members, pads, and plates are interconnected by a plurality of fastening means each extending through the load distribution plates, the flattened chord sections and one of the strut attachment pads; and

wherein at least two of said fastening means pass through each of said flattened cord sections to strengthen the node.

4,704,837

WALL CONSTRUCTION

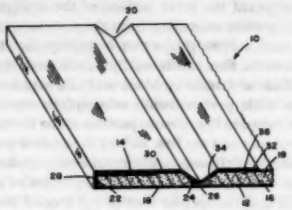
Robert J. Menchetti, Buffalo, and Robert M. Chapman, North Tonawanda, both of N.Y., assignors to National Gypsum Company, Dallas, Tex.

Filed Aug. 15, 1986, Ser. No. 896,967

Int. Cl.[4] E04C *2/00*

U.S. Cl. 52—631 **12 Claims**

1. A wall panel unit comprising a single piece, paper covered gypsum wallboard having spaced grooves and, laminated thereto, a sheet of bendable rigid sheet metal in the area of each said groove, said grooves having a V-shape of an angle of about 100° and being parallel to and located about three inches from each longitudinal edge of said wallboard, said grooves having a depth equal to the thickness of one layer of paper plus the thickness of the gypsum core, and said laminated sheet metal being disposed on said wallboard in the areas of said grooves and being shaped to substantially conform to the abutting surface of said wallboard to which said sheet metal is



laminated, whereby said wallboard and said metal may be simultaneously bent to substantially close said groove and to remain bent while free of any adhesive in said groove by said rigid bent sheet metal which is laminated to said wallboard.

4,704,838

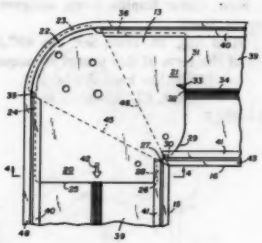
ROUNDED CORNER CEILING RUNNER SYSTEM

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Oct. 22, 1986, Ser. No. 921,497

Int. Cl.[4] E04C *2/38*

U.S. Cl. 52—658 **1 Claim**



1. A rounded corner runner system for a partition intersection comprising:

a generally L-shaped coupling plate having first and second tongues and an arcuate mandrel projecting away from the tongues, the first tongue having an outside edge, a leading edge and an inside edge terminating at a line bisecting the plate, and the second tongue having an outside edge, a leading edge having a curved segment opposite the arcuate mandrel and a downwardly inclined barb, and an inside edge which terminates at the line bisecting the plate; and

a runner having an arcuate flange and angularly opposed first and second legs joined by the arcuate flange, each leg being a channel having a web portion, an exterior flange and interior flange extending at right angles from the web, and a pair of opposed ribs spaced apart from the parallel to the web with which they form a pair of slots within the channel, the exterior flanges being continuous with the arcuate flange and the interior flanges intersecting at an angle;

wherein the first tongue of the coupling plate rests within the slots of the first leg of the runner, the arcuate flange of the runner is congruent with the arcuate mandrel of the coupling plate, the second tongue of the plate rests within the slots of the second leg of the runner and the inclined barb on the second tongue is in firctional engagement with the underside of the web of the second leg of the channel.

4,704,839

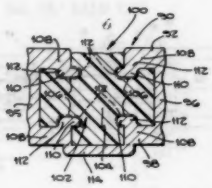
THERMAL BARRIER EXTRUSION

Carl J. Kay, Burbank, Calif., assignor to Products Research & Chemical Corporation, Glendale, Calif.

Continuation of Ser. No. 806,101, Dec. 6, 1985, abandoned. This application Dec. 12, 1986, Ser. No. 941,187

Int. Cl.[4] E04C *3/30*

U.S. Cl. 52—732 **15 Claims**



1. A composite structure adapted for use as a thermal barrier comprising:

a metallic channel body having a C-shaped left side, a C-shaped right side facing said left side, an open bottom extending between the two sides and an open top defining a longitudinal thermal barrier cavity, wherein said C-shaped sides each includes horizontal top and bottom portions and a vertical side portion extending therebetween;

a solid, void free thermally insulating material located in said thermal barrier cavity in an amount sufficient to substantially fill said thermal barrier cavity and wherein said thermally insulating material contracts over a period of time more than said channel body thereby resulting in longitudinal shrinkage of said thermally insulating material relative to said channel body and wherein said insulating material is susceptible to impact fracture to allow separation of said channel body left side and right side;

a plurality of projections attached to said channel body and extending vertically into said thermally insulating material from each of said horizontal top and bottom portions of said C-shaped sides, said projections having a cross-sectional configuration whose width increases away from the point of attachment to thereby provide bidirectional locking of the thermally insulating material within the channel body to reduce longitudinal shrinkage of said thermally insulating material relative to said channel body and increase the resistance of said channel body to separation of said right and left sides by fracture of said thermally insulating material.

4,704,840

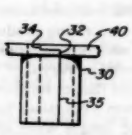
MOLD AND METHOD OF USE

Paul J. Gatto, 1011 N. Northlake Dr., Hollywood, Fla. 33019

Filed Feb. 21, 1986, Ser. No. 831,573

Int. Cl.[4] E04B *5/48;* **E04F** *17/08;* **E04G** *23/00*

U.S. Cl. 52—741 **1 Claim**



1. A process of filling a space about a tubular member in a passageway of a structural building partition utilizing a molded sleeve having an outer facing surface and an inner facing surface and further having a longitudinal slit, said slit having opposed edges for mating contact with each other, said opposed edges having complementary longitudinal recesses disposed therein respectively thereby causing the respective inner and outer facing surfaces to be continuous when said sleeve is positioned about a tubular member, with an integrally formed annular flange member having a planar top surface connected to one end of said sleeve, comprising the steps of:

positioning the sleeve about said tubular member;

positioning the top surface of said annular flange member in interfacial contact with one surface of said partition whereby said annular flange member provides a bottom surface for said passageway;

securing said sleeve to said tubular member by closing said slit together for preventing movement thereof during filling of said space with a sealant material;

filling said space with a sealant material; and

permitting said sealant to solidify;

removing said sleeve after solidification of said sealant material whereby top and bottom surfaces of said sealant are co-extensive with top and bottom surfaces, respectively, of said partition, said space being shaped as an inverted funnel.

4,704,841

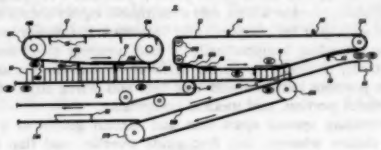
BEVERAGE TRAY PACKING SYSTEM

Keith A. Langenbeck, 4005 University Blvd., Dallas, Tex. 75205

Filed Jul. 28, 1986, Ser. No. 889,734

Int. Cl.[4] B65B *35/44, 57/12, 39/12, 5/08*

U.S. Cl. 53—448 **37 Claims**



1. A system for packing containers into corresponding transport trays comprising:

first conveyor means for transporting said containers along a first track;

means for dividing said containers into selected groups, the number of containers in each group corresponding to the number of containers to be packed into each tray;

second conveyor means for transporting said trays along a second conveyor track, a portion of said second conveyor track being inclined with respect to said first conveyor track so that said first and second tracks converge at a predetermined location;

ramp means having an upstream end and a downstream end, said ramp means being pivotally attached to said first track at a selected position on said ramp means between said upstream end and said downstream end to define a first portion between said upstream end and said selected position and a second portion between said selected position and said downstream end, said ramp means for being moved upwardly to an inclined position with respect to said first track when said second portion of said ramp means is in contact with the leading or the trailing edge of one of said trays and for being returned to a substantially horizontal position with respect to said first track when said second portion of said ramp means is not in contact with the leading or the trailing edge of one of said trays, said first portion of said ramp means for engaging said first track to prevent said second portion of said ramp means from being pivoted below said horizontal position; and

means for controlling the movements of the containers on the first track and the trays on the second track so that each group of containers is packed into the corresponding tray in succession from the leading to the trailing edge of

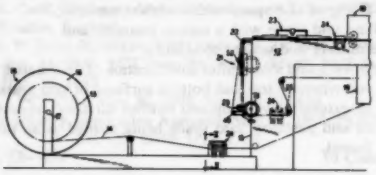
the tray while the tray is being moved upwardly along the inclined portion of the second track.

4,704,842

METHOD AND APPARTUS FOR HANDLING RECLOSABLE WRAPPER SHEET MATERIAL

Hugo Boeckmann, Arlington Heights, and Donald L. Van Erden, Wildwood, both of Ill., assignors to Minigrip, Inc., Orangeburg, N.Y.

Filed Oct. 15, 1985, Ser. No. 787,119
Int. Cl.[4] B65B *9/06*
U.S. Cl. 53—450 **22 Claims**



1. A method of longitudinally conducting a continuous elongated wrapper sheet to a form, fill, and seal machine taking in said wrapper sheet, said wrapper sheet having a panel sheet portion having one free end for receiving product thereon in said machine, a flap sheet portion formed by a web fold at the other end of said panel sheet portion partially overlying said panel sheet portion width, and a reclosable zipper means in the form of a pair of cooperatively interlocked fastener profile strips extending longitudinally of said wrapper sheet and respectively disposed on facing surfaces of said panel and flap sheet portions between said web fold and a free edge of said flap sheet portion, said method comprising:

providing spaced apart first and second guides at a first station wherein said first guide overlies said flap sheet portion from said web fold to beyond said zipper means but short of said free edge thereof and said second guide overlies said panel sheet portion from said free edge thereof to short of said free edge of said flap sheet portion,

turning said flap sheet portion off of said panel sheet portion such that said free edge of said flap sheet portion is raised from said panel sheet portion in a gap betwen said first and second guides,

folding over said flap sheet portion to expose said facing surface of said panel sheet portion previously underlying said flap sheet portion beyond said zipper means, and

passing said folded over flap sheet portion beneath a third guide at a second station downstream of said first station in the direction of conduction of said wrapper sheet to said machine.

4,704,843

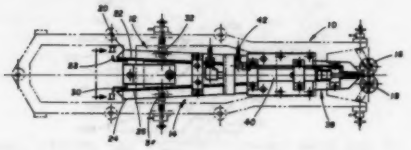
APPARATUS AND METHOD FOR PACKAGING ARTICLES

Dave L. Owen, Wellford, and David K. Domnitz, Taylors, both of S.C., assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Sep. 26, 1986, Ser. No. 912,443
Int. Cl.[4] B65B *9/08, 51/14*
U.S. Cl. 53—450 **5 Claims**

1. In an apparatus for packaging articles in heat sealable thermoplastic film, the articles spaced longitudinally along the film, said apparatus including means for forming a tube from the film, means for longitudinally sealing said film, a wheel and a series of transverse sealing dies carried by said wheel to effect transverse sealing of the packaged articles between said articles as they are carried around the wheel, means for severing said tube between each packaged article, and means for coordinating the stream of articles, film, and die operation to insure transverse sealing of the sealing dies at the proper location between packaged articles, the improvement comprising means for supporting said film prior to longitudinally sealing said film to form a tube, said means comprising:

(a) a pair of film guides disposed opposite to each other, each guide including a horizontal plate, and integrally connected therewith a vertical plate, said vertical plate having an inverted U-shaped channel to support the upper edge of the film;



(b) a pair of rollers, disposed opposite each other in slots located downstream from the edge of the vertical plates on each film guide, for supporting the lower vertical segment of the film; and

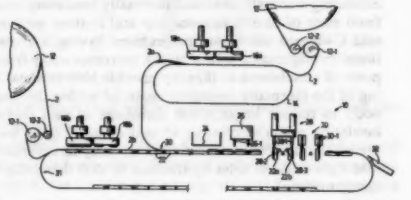
(c) said U-shaped channels of said first and second film guide tapering towards each other with respect to the longest dimension of the apparatus so that the film edges track closer to each other as the film is drawn toward the means for longitudinally sealing said film.

4,704,844

PACKAGING MACHINE

Derek Mancini, 21 Progress Avenue, Unit 2, Scarborough, Ont., M1P 4S8, Canada

Filed Jul. 18, 1986, Ser. No. 886,726
Int. Cl.[4] B65B *47/02, 47/04, 43/08*
U.S. Cl. 53—453 **20 Claims**



1. A method of forming a container, filling the formed container and sealing the container comprising;

advancing two strips of formable material through separate forming operations and shaping each strip to form a series of half containers each having a recess therein generally surrounded by a similarly sized flange.

aligning the two strips in opposed relation abutting the flanges of opposed half containers in a manner to form a central cavity for receiving product by having said container halves of each of said strips received in a recessed plate of a horizontal conveyor,

securing the opposed flanges substantially about the periphery thereof to form a container having a liquid tight seal between opposed flanges while leaving an unsealed area between opposed flanges for filling of the container,

cutting each of the formed containers from the strip material and rotating said plates to appropriately orientate the containers with the unsealed area at a raised position,

filling each formed container through the unsealed area, and

subsequently sealing the remaining portion of the opposed flanges providing a liquid tight seal thereabout.

4,704,845

METHOD AND APPARATUS FOR CLOSING BAGS AND A PLANT FOR BAGGING BULK MATERIALS

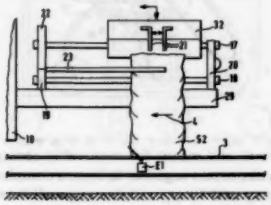
Gmur Bruno, St. Gallen, Switzerland, assignor to Gebruder Buhler AG, Uzwil, Switzerland

Continuation of Ser. No. 537,273, Sep. 29, 1983, abandoned. This application May 8, 1986, Ser. No. 862,183

Claims priority, application Switzerland, Oct. 16, 1982, 6013/82

Int. Cl.[4] B65B *7/08*

U.S. Cl. 53—482 10 Claims



1. Apparatus for automatically closing filled, open-topped bags, which comprises:

conveyor means for continuously advancing the filled bags in generally upright orientation at a predetermined speed along a predetermined input path from a receiving end to a discharge end;

a pair of pivotal depending fingers mounted for reciprocal movement along said conveyor means in a direction generally parallel to the input path;

means for effecting reciprocal movement of said fingers substantially synchronous with movement of each successive bag along a predetermined portion of the input path;

means mounted for movement with said fingers for effecting pivotal movement of said fingers about an axis generally parallel to the input path into and out of the top of each successive bag responsive to positioning of the bags along the input path;

means mounted for movement with said fingers for effecting pivotal movement of said fingers about an upright axis generally transverse to the input path into and out of a spread position engaged with the top end of each successive bag responsive to positioning of the bags along the input path;

means for closing the spread top ends of each successive bag advanced by said conveyor means along the input path;

means for folding the closed, top end of each successive bag advanced by said conveyor along the input path; and

means for securing the folded, closed top end of each successive bag advanced by said conveyor along the input path.

4,704,846

APPARATUS FOR SORTING AND BUNCHING FLOWERS AND OTHER AGRICULTURAL PRODUCE

Monick Lev, Kfar Saba, and Brois Frankstein, Holon, both of Israel, assignors to State of Israel-Ministry of Agriculture, Bet Dagan, Israel

Filed Nov. 15, 1985, Ser. No. 798,570

Claims priority, application Israel, Nov. 27, 1984, 73653

Int. Cl.[4] B65B *13/02, 63/00*

U.S. Cl. 53—522 15 Claims

1. Apparatus for simultaneously sorting and bunching flowers and similar produce of different lengths comprising:

a frame;

an endless belt mounted for rotation on said frame and comprising a plurality of hoop shaped flexible divider elements mounted on the surface thereof, adjacent divider elements defining a plurality of bunched produce locations on the surface of said belt;

a plurality of sorting tables for sorting said produce each adapted to be arranged adjacent the endless belt, there being mounted on said frame downstream of each said sorting tables an associated adjustable alignment means for aligning the sorted produce;

first bunch stem trimming means mounted on said frame downstream of said tables;

bunch stem cleaning means mounted on said frame downstream of the stem trimming means;

bunch tying means coupled to said frame downstream of the stem cleaning means; and

second bunch stem trimming means mounted on said frame downstream of said tying means,

wherein a sorting operation can be performed simultaneously on different length produce at each of said plurality of sorting tables independently of the operation at another one thereof, said sorting operation being performed in accordance with the alignment means adjustment of the associated sorting table.

4,704,847

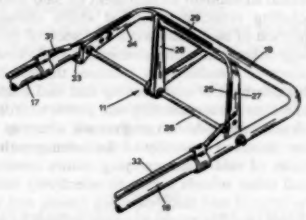
CONTROL MECHANISM FOR WALK-BEHIND MOWER

C. Austin Greider, Des Moines, and Timothy E. Berry, Johnston, both of Iowa, assignors to Western International, Inc., Des Moines, Iowa

Filed Dec. 9, 1985, Ser. No. 806,531

Int. Cl.[4] A01D *34/82, 34/67*

U.S. Cl. 56—10.5 4 Claims



1. A dual function manual control assembly for actuating two independently controlled mechanisms of a power driven lawn mower having a handle bar that is attached to a rear portion of the mower body and is formed with opposite side portions and a rear cross portion extending between said side portions, said assembly comprised of:

(a) a first bale member having one end pivotally associated with one of said opposite side portions and an opposite distal end;

(b) a second bale member having one end pivotally associated with the other of said opposite side portions and an opposite distal end adjacent to the distal end of the first bale member;

(c) means for pivotally connecting said opposite distal ends of said bale members in association with said handle bar in such fashion that either of said bale members is independently pivotable from a normal nonactuating position to an actuating position in which said bale member lies adjacent said handle bar;

(d) means connected to said first and second bale members and said controlled mechanisms so that one of said mechanisms is actuated by pivotal movement of said first bale

member and the other of said mechanisms is actuated by pivotal movement of said second bale member; and

(e) each of said bale members includes a transverse portion conforming to the peripheral shape of the cross portion of said handle bar whereby said cross portion is received in said bale transverse portions when said bales are in their actuating positions to operatively form a unitary member with said cross portion.

4,704,848

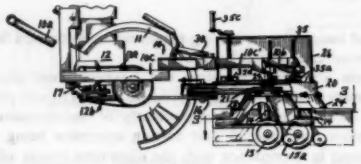
ROTARY LAWN MOWER

William G. Nannen, P.O. Box 116, Smethport, Pa. 16749

Filed Jul. 1, 1985, Ser. No. 750,788

Int. Cl.[4] A01D *34/67, 34/74*

U.S. Cl. 56—17.2 **8 Claims**



1. A rotary lawn mower comprising an elongated framework including a laterally extending forward support member, wheels supporting the rear of said framework, other wheels mounted on non-rotating shafts selectively secured to said laterally extending forward support member, the rear of said framework representing a power portion mounting a power source and the forward portion of said framework representing a cutter portion, said cutter portion defined by blade carrying rotors rotatable on and slidable along said and decking overlying said blade carrying rotors and movable vertically therewith, a vertical adjustment arrangement for said blade carrying rotors including rotatable threaded shafts connecting said forward portion of said framework and secured to said decking, chain-sprocket means interconnecting said threaded shafts serving selective simultaneous rotation thereof to achieve vertical displacement of said decking and said blade carrying rotors, and means interconnecting said power source powering said wheels and said blade carrying rotors, where an anti-gouging member mounted inwardly of the cutting path presented by the blades of said blade carrying rotors combining with each of said other wheels serves to selectively minimize the blade drop ratio of said blade carrying rotors, and where said rotatable blade carrying rotors are each defined by an arrangement including a body member having a central region from which three non-opposing spaced-apart single spokes extend downwardly and outwardly, terminating at free lower ends, and an outwardly extending cutter blade secured to each of the latter, and where said three non-opposing spaced-apart single spokes, together with a member interconnecting each of said free lower ends, present a generally triangular rotor configuration on all sides and at the bottom, serving stiffness and minimal wind resistance.

4,704,849

WHEEL-MOUNTED WEED TRIMMER

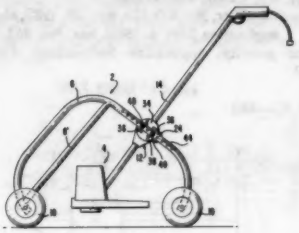
Zachary R. Gilbert, 400 N. 72 Way, Hollywood, Fla. 33024, and Richard A. Gorz, 2115 Nova Village Dr., Davie, Fla. 33317

Filed Dec. 17, 1985, Ser. No. 809,751

Int. Cl.[4] A01D *34/67*

U.S. Cl. 56—17.5 **6 Claims**

1. Apparatus for supporting a mowing device having an elongate handle comprising first frame means having at least two wheels mounted thereon for rotation about first parallel axes, second frame means having at least two wheels mounted thereon for rotation about second parallel axes, first yoke means fixed to said first frame means at one end thereof and having means forming a first portion of a receptacle for receiving said handle at an opposite end thereof, second yoke means fixed to said second frame means at one end thereof and having means forming a second portion of said receptacle at an opposite end thereof, and means for removably securing said first and second yoke means together to form a complete receptacle and for placing said first parallel axes parallel to said second parallel axes.



4,704,850

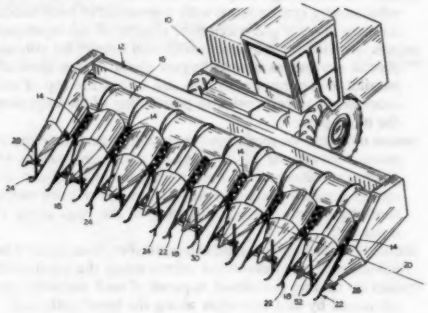
CROP LIFTING ATTACHMENT FOR COMBINE SNOUT

Dale T. Obermeier, 1950 First St., Aurora, Nebr. 68818

Filed Feb. 14, 1986, Ser. No. 829,212

Int. Cl.[4] A01D *63/00*

U.S. Cl. 56—119 **11 Claims**



1. A crop lifting attachment for a combine head, said head including a plurality of transversely spaced-apart forwardly extended gathering shields mounted thereon for pivotal movement about respective transverse pivot axis, said attachment comprising, an elongated lift bar having forward and rearward ends, turned up foot means on the forward end thereof for sliding movement on the ground,

means for pivotally supporting the rearward end of the lift bar on a gathering shield for pivotal movement therewith about the respective transverse pivot axis therefor,

means for adjustably supporting said lift bar, at an intermediate position between said forward and rearward ends, on a forward portion of said gathering shield for transverse movement toward and away from the forward end of the gathering shield,

lock means for securing the lift bar in a selected transverse position relative to the gathering shield, and

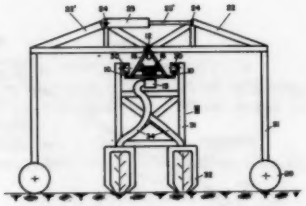
an auxiliary lift bar connected to said lift bar adjacent said turned up foot means and inclined upwardly and transversely therefrom.

4,704,851

AGRICULTURAL TRANSPORT SYSTEM

Gedalyahu Manor, Haifa, Israel, assignor to Technion Research & Development Foundation, Haifa, Israel

Filed Apr. 22, 1986, Ser. No. 854,556
Int. Cl.[4] B65G *53/24, 37/00*; A01D *46/26*
U.S. Cl. 56—328 TS 20 Claims



1. A power-driven structure adapted to carry and more implements across an area without compacting the soil over which the implements are made to travel, the structure comprising:

a longitudinal, substantially horizontal elongated girder means having opposite end portions which are supported by respective carriages adapted to at least travel in a direction substantially perpendicular to the axis of said girder means,

said carriages comprising means for raising said girder means to a height permitting passage of said girder means over tall obstacles, and for lowering said girder means to within a small distance from the ground,

said girder means being provided with:

mechanical conveying means for carrying material along said girder means and for depositing said carried material to a point beyond one of said carriages,

pneumatic conveying means for conveying material suitable for pneumatic conveyance to container means positioned beyond one of said carriages,

guide means for carrying at least one implement over at least part of the length of said girder means, and

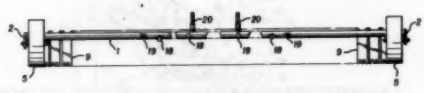
means for conveying materials from said at least one implement to at least one of said mechanical and pneumatic conveying means.

4,704,852

RAKE FOR BASEBALL AND SOFTBALL FIELDS

Richard W. Knapp, R.D. #2, Saegertown, Pa. 16422

Filed Oct. 22, 1985, Ser. No. 790,160
Int. Cl.[4] A01D *7/00*
U.S. Cl. 56—400.14 4 Claims



1. A rake for baseball and softball infields and baselines comprising,

an elongated frame,

a series of sheet metal teeth spaced apart along the length of the frame with upper ends fixed to the frame and with lower ends engaging said surface to be raked, the lower ends of the teeth having spaced serrations providing individual flat bottomed teeth,

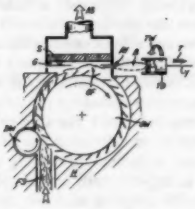
a pair of wheel supporting arms respectively fixed to opposite ends of the frame and having free ends extending forward from the frame, an axle extending inward from each free ends, a wheel mounted on each axle, hitching means on the frame for towing the frame over the surface to be raked by hand or by power.

4,704,853

SPINNING OF YARN

Carl A. Lawrence, Hebden Bridge, England, assignor to National Research Development Corporation, London, England

PCT No. PCT/GB85/00436, § 371 Date May 20, 1986, § 102(e) Date May 20, 1986, PCT Pub. No. WO86/01842, PCT Pub. Date Mar. 27, 1986
PCT Filed Sep. 20, 1985, Ser. No. 879,112
Claims priority, application United Kingdom, Sep. 21, 1984, 8424009; Sep. 28, 1984, 8424490
Int. Cl.[4] D01H *1/135, 7/898*
U.S. Cl. 57—401 18 Claims



1. A method of spinning fibers into yarn including

providing a supply of fibres,

providing a surface to receive opened fibres,

opening the fibres close to said surface, maintaining said closeness as a defined gap with the surface within reach of fibers being opened,

directing the opening fibers through said gap towards said surface immediately they are opened,

positioning a yarn in said gap with respect to the surface,

applying twist to said yarn close to but not through said surface,

withdrawing the twisted yarn, building fibres directed toward the surface onto the yarn as it is withdrawn,

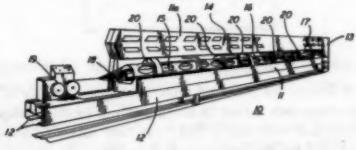
thereby spinning fibres from said supply directly into an output yarn including a twist.

4,704,854

FLEXIBLE COUPLING FOR A WIRE STRANDING MACHINE

Dean L. Williams, Rome, N.Y., assignor to M.G.S. Manufacturing, Inc., Rome, N.Y.

Filed Mar. 6, 1987, Ser. No. 22,645
Int. Cl.[4] D07B *3/04*
U.S. Cl. 57—58.34 12 Claims



1. In a stranding machine for the production of rope from a plurality of strands comprising a rotary tube formed of a plurality of tube sections coupled end to end to rotate about a common axis, each said tube section including a plurality of cradles for dispensing the strands; a frame supporting said tube sections; at least one bearing rotationally supporting said tube

from said frame; and at least one flexible connector connecting an end of one of said tube sections to a corresponding end of an adjacent one of said tube sections; the improvement wherein said at least one bearing includes an encircling bearing member having an inner race and an outer race, bearing mounting means for mounting said inner race into an outer surface of one said tube section, bearing housing means for holding said outer race, and flexible support means for mounting said bearing housing means to said frame; said flexible support means including a flexible resilient bushing, means mounting said bushing to said frame, and means mounting said bushing to said bearing housing.

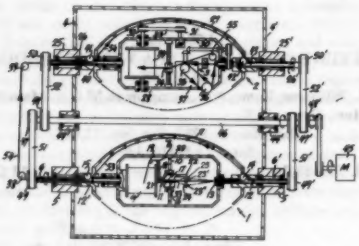
6. In a stranding machine for the production of rope from a plurality of strands, comprising a rotary tube formed of a plurality of tube sections coupled end to end to rotate about a common axis, each said tube section including a plurality of cradles for dispensing the strands; a frame supporting said tube sections; at least one bearing rotationally supporting said tube from said frame; and at least one flexible connector connecting and end of one of said tube sections to a corresponding end of an adjacent one of said tube sections; the improvement wherein said flexible connector includes a pair of spiders each having a central mounting hub and a plurality of radial spokes where ends are affixed to an associated one of said tube sections; a barrel connector including a generally cylindrical body and radial flanges at opposite ends of said cylindrical body; a pair of resilient flexible coupling members; first fastener means for connecting said spider mounting hubs to said flexible coupling members; and second fastener means for connecting said flexible coupling members to respective ones of said barrel connector end flanges.

4,704,855

WIRE TWISTING DEVICE

Kinji Yoshida, and Kazuo Iura, both of Izumi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan

Filed Jun. 13, 1986, Ser. No. 874,297
Claims priority, application Japan, Apr. 27, 1984, 59-87431
Int. Cl.[4] D01H *7/86*
U.S. Cl. 57—58.54 **16 Claims**



1. A device for twisting wire having a plurality of strands which comprises a first twisting portion having a supply reel carrying said wire, and a first flyer bow rotatable about a first axis defined by the ends of said first bow,

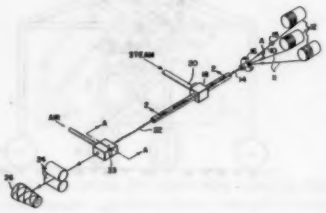
a second twisting portion, downstream of said first portion, having a second flyer bow rotatable about a second axis defined by the ends of said second bow, means for drawing said wire through said first portion and into said second portion, a take up reel adapted to receive said wire, means for rotating said flyer bows about said first and second axes, whereby said wire is twisted by said first and second portions.

4,704,856

FALSE TWISTED DIFFERENTIAL TENSION YARN

Thomas L. Nelson, Georgetown, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 817,385, Jan. 9, 1986. This application Apr. 30, 1986, Ser. No. 857,350
Int. Cl.[4] D02G *3/38, 3/04*
U.S. Cl. 57—228 **10 Claims**



1. A continuous multifilament crimped polyamide yarn suitable for use in loop pile carpeting comprising at least one continuous multifilament crimped core yarn and at least one continuous multifilament crimped wrap yarn characterized by:

(a) the filaments of the wrap yarn being from 1 to 14% longer than the filaments of the core yarn;

(b) some of the filaments within the wrap yarn being lightly bonded to each other and to some of the filaments of the core yarn;

(c) the wrap yarn being wrapped around the core yarn in random reversing coils; and

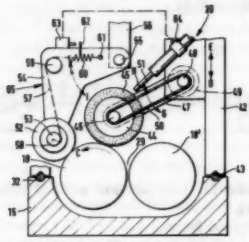
(d) the wrap yarn being tightly wrapped around the core yarn.

4,704,857

OPEN-END FRICTION SPINNING MACHINE PROVIDED WITH DEVICES FOR MONITORING FRICTION CHARACTERISTICS AND CONDITIONING SPINNING SURFACES

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Continuation of Ser. No. 761,685, Aug. 2, 1985, abandoned. This application Feb. 19, 1987, Ser. No. 16,986
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1984, 3428509
Int. Cl.[4] D01H *7/885, 11/00*
U.S. Cl. 57—264 **21 Claims**



1. An open-end friction spinning apparatus including at least one spinning unit having a yarn formation zone adjacent drivable friction surface means comprising:

at least one friction surface conditioning means for conditioning said friction surface means, said at least one conditioning means including pivotably mounted transfer roller means adjacent said friction surface means, and

friction surface monitoring means for monitoring friction characteristics of said friction surface means,

said friction surface monitoring means including monitoring roller means and measuring means for measuring a frictional force applied to said monitoring roller means by said friction surface means.

4,704,858

FALSE TWISTING APPARATUS

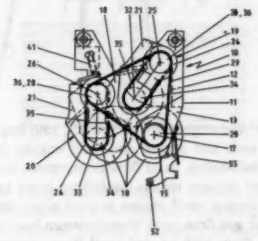
Geoffrey Naylor, Macclesfield, and Philip M. Wilkinson, Cheadle, both of England, assignors to Rieter Scragg Limited, Cheshire, England

Filed Oct. 2, 1986, Ser. No. 914,279

Claims priority, application United Kingdom, Oct. 10, 1985, 8525048

Int. Cl.[4] D02G *1/04, 1/08*

U.S. Cl. 57—340 **18 Claims**



1. Apparatus for false twisting yarns comprising three rotatable shafts, a plurality of discs mounted on each shaft, a base member having three axes located therein at the apices of an equilateral triangle and on which base member said shafts are mounted, shaft mounting means operable to allow relative movement of said shafts relative to each other whilst maintaining a mutually parallel, equilaterally spaced relative disposition, said mounting means including pivoting means whereby each movable shaft is mounted on said base member so as to be pivotal about a respective one of said axes, the apparatus also comprising three first drive pulleys each being mounted on said base member for rotation about a respective one of said axes, a primary drive belt passing around said first drive pulleys, and for each movable shaft a second drive pulley mounted for rotation with a first drive pulley about a respective axis, a third drive pulley mounted on said each movable shaft and a respective secondary drive belt passing around said second and third drive pulleys.

4,704,859

ROTARY TWISTER ELEMENT FOR FRICTIONAL OPEN-END SPINNING

Giovanni Nerli, Florence; Francesco Grego, Venice; Roberto Bottos, and Francesco Ferro, both of Pordenone, all of Italy, assignors to Officine Savio S.p.A., Pordenone, Italy

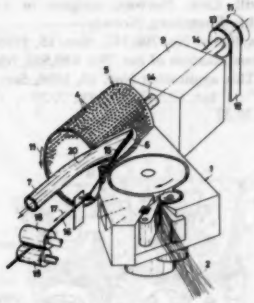
Filed Feb. 3, 1987, Ser. No. 10,407

Claims priority, application Italy, Feb. 26, 1986, 19551 A/86

Int. Cl.[4] D01H *7/892, 7/898*

U.S. Cl. 57—401 **3 Claims**

1. Rotary twister element for frictional open-end twisting, constituted by a solid, hollow, reduced-thickness element with perforated skirt, provided in its interior with a suction duct defining a longitudinal suction slot, one of the two longitudinal edges of which constitutes the thread formation line, characterized in that said edge constituting the thread formation line



is inclined relatively to the generatrix of the same solid element.

4,704,860

FIBER FEED ARRANGEMENT FOR OPEN-END FRICTION SPINNING MACHINES

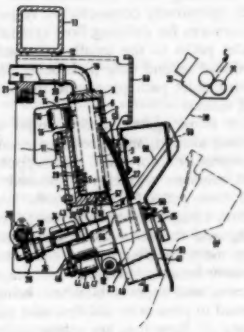
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Uberkingen, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Sep. 22, 1986, Ser. No. 909,944

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1985, 3533718

Int. Cl.[4] D01H *1/135, 7/898*

U.S. Cl. 57—401 **18 Claims**



1. Arrangement for open-end friction spinning including:

at least one friction roller creating a yarn-forming zone,

an opening device housing;

an opening device arranged in the opening device housing;

a fiber feeding duct extending from the opening device to the at least one friction roller opposite the yarn-forming zone, said fiber feeding duct being a one-piece component, said fiber feeding duct being unitarily mounted at the opening device housing; and

holding means for holding the fiber feeding duct in a stationary position, said holding means including a securing means for permitting quick removal of the opening device housing.

4,704,861

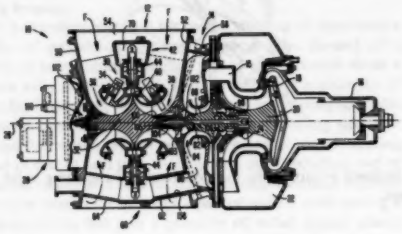
APPARATUS FOR MOUNTING, AND FOR MAINTAINING RUNNING CLEARANCE IN, A DOUBLE ENTRY RADIAL COMPRESSOR

R. Jan Mowill, Oslo, Norway, assignor to A/S Kongsberg Vapenfabrikk, Kongsberg, Norway

Continuation of Ser. No. 798,147, Nov. 15, 1985, abandoned, which is a continuation of Ser. No. 610,580, May 15, 1984, abandoned. This application Nov. 19, 1986, Ser. No. 933,357

Int. Cl.[4] F02C 7/04, 7/20

U.S. Cl. 60—39.32 20 Claims



1. Apparatus for controlling the running clearance and improving the stability of a dual entry radial gas compressor of the type having a housing with a pair of axially opposed entrances for the incoming gas, a common radially disposed exit, diffuser means for converting high velocity gas received from the compressor exit to higher pressure, higher temperature and lower velocity, and a compressor rotor positioned within the housing and mounted on a shaft, the diffused high pressure, high temperature gas being deliverable to an axially adjacent compressed gas receiving means, the receiving means also including compressor driving means having a drive shaft for in-line connection to the compressor shaft, the apparatus comprising:

compressor inlet shround means for channeling the incoming gas to the compressor entrances, said inlet shroud means including flow symmetric first and second inlet shrouds operatively connected to respective compressor axial entrances for defining flow symmetric first and second inlet paths to the axially opposed compressor entrances, said second flow path being defined as the flow symmetric inlet path proximate the compressed gas receiving means;

a plurality of elongated, hollow rigid support members distributed around, and extending essentially parallel to, the compressor rotor shaft, said support member having support member segments positioned in said first and second flow paths for supportably interconnecting the dual entry compressor housing, said first and second inlet shrouds, and the compressed air receiving means, said support members determining the axial position of the compressor housing relative to the compressed gas receiving means, said support members being configured and positioned to present in said first inlet path, profiles to the incoming air flow that are substantially identical to the profiles presented to said second inlet path;

means for channeling the hot diffused or partly diffused gas leaving the compressor into the interior of at least two of said support member segments;

means for flow connecting the interior of said two support member segments to the compressed air receiving means, said two support member segments comprising the primary means for delivering the high pressure, high temperature gas from the dual entry radial gas compressor axially to the adjacent compressed gas receiving means; and

means for allowing the compressor rotor to follow the compressor housing to accommodate changes in the axial location of the compressor housing relative to the receiving means caused by temperature induced changes in the axial lengths of said two support member segments during compressor operation.

4,704,862

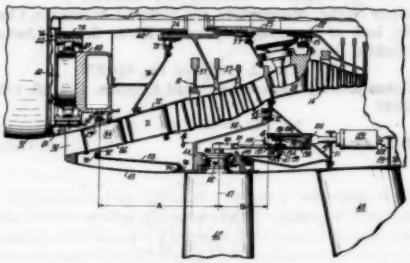
DUCTED PROP ENGINE

William T. Dennison, South Windsor, and Robert F. Brodell, Marlborough, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 29, 1985, Ser. No. 738,703

Int. Cl.[4] F02K 3/02

U.S. Cl. 60—226.2 18 Claims



1. A gas turbine engine for an aircraft, said engine having an axis, a front end, and a rear end, said engine comprising, in series flow relationship, axial flow compressor means, combustor means, and turbine means, including inner and outer concentric core stream wall means spaced apart defining a core stream annular gas flow path therebetween having an inlet and including the flow path of said axial flow compressor means;

bypass duct means surrounding said compressor means, including inner and outer concentric bypass duct wall means defining an annular bypass stream flow path therebetween surrounding said core stream flow path;

a disk disposed entirely between said core stream gas flow path and said bypass stream flow path downstream of said core stream flow path inlet and rotatable about said engine axis;

a plurality of circumferentially disposed airfoils secured to said disk and extending across said bypass stream flow path;

stationary engine support structure disposed radially outwardly of said core stream gas flow path and extending from said outer core stream wall means to said outer bypass duct wall means;

first bearing support means disposed radially inwardly of said core stream gas flow path;

first bearing means disposed radially inwardly of said core stream gas flow path and mounted on said first bearing support means, said first bearing means including a first rotatable race;

second bearing means axially spaced from said irst bearing means and mounted on said engine support tructure radially outwardly of the core stream flow ath and including a second rotatable race;

disk support means extending etween and attached to said disk and second rotatable ace and being relatively stiff in the radial irection for transmitting aircraft maneuver loads and entrifugal loads from said disk into said engine upport structure; and

drive means connecting said turbine means to said disk for rotating said disk including torque transmitting means secured to said first rotatable race, said torque transmitting means including airfoil shaped strut means rotatable about the engine axis and extending across the flow path of said axial flow compressor means and connected to said disk for rotating said disk and airfoils about the engine axis and for transmitting maneuver loads from said disk into

said first bearing support means, wherein the axial location of said disk is such that a major portion of the maneuver loads therefrom are transmitted into said engine support structure, and a minor portion of the maneuver loads therefrom are transmitted into said first bearing support means.

4,704,863

EXHAUST GAS FILTER FOR DIESEL ENGINES

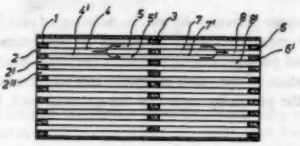
Joerg Abthoff, Pluederhausen; Hans-Dieter Schuster, Schorndorf; Gunter Loose, Remseck, and Bernhard Jokl, Neuhausen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 19, 1985, Ser. No. 810,766

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1985, 3501182

Int. Cl.[4] F01N *3/02*

U.S. Cl. 60—311 **16 Claims**



1. A process for manufacturing an exhaust gas filter for Diesel engines comprising a monolithic filter block made of a porous ceramic material having a plurality of ducts extending in the main flow direction of the exhaust gases from the inlet to the outlet of said filter, said ducts alternately being closed by plug means in order to force the passage of the exhaust gas through the duct walls, wherein the filter block is divided into zones, each zone having duct walls with decreased porosity from the previous zone in the main flow direction of the exhaust gases, and wherein additional plug means are arranged in the area of the border of the zones in such a way that the exhaust gas must flow through the duct walls of more than one zone as said gas flows from the inlet to the outlet of said filter, comprising the steps of: immersing a filter block blank with the largest desired porosity up to the desired zone border in a solution or suspension of a porosity-reducing agent; subsequently drying said filter block blank; immersion and drying process steps being repeated for producing additional zones; and providing the filter block blank with plug at the additional zone borders.

4,704,864

SPOKE ARRANGEMENT FOR A HYDRODYNAMIC TORQUE CONVERTER

Eberhard Frötschner, Gerlingen, and Otto Wörner, Reutlingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 4, 1986, Ser. No. 906,400

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1985, 3531520

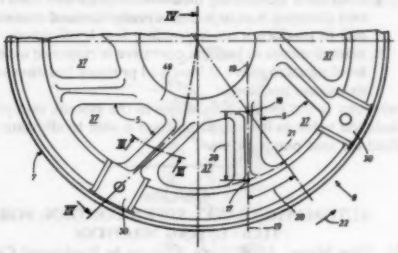
Int. Cl.[4] F16D *33/00;* **F16H** *55/40*

U.S. Cl. 60—330 **17 Claims**

1. In a spoked drive wheel having spoke for connecting a wheel hub to an external ring of a spoked drive wheel for a hydrodynamic torque converter operating with power splitting, comprising:

the spoke having cross-section extending along a profile main axis in the shape of a wing profile and the profile main axis being transverse to the axis of rotation of the wheel; and

wherein the profile main axis is set at an acute angle of incidence relative to a plane perpendicular to the axis of



rotation and transverse to the incident flow direction of fluids in the torque converter.

4,704,865

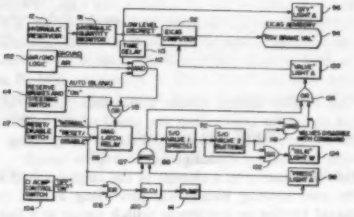
HYDRAULIC RESERVE SYSTEM FOR AIRCRAFT

Ralph Archung, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 16, 1984, Ser. No. 631,226

Int. Cl.[4] F16D *31/02*

U.S. Cl. 60—405 **20 Claims**



1. A hydraulic system for an aircraft, said system comprising:

a. a fluid reservoir comprising a containing structure defining a fluid containing chamber and having a top wall and a bottom wall, said reservoir further comprising a first fluid inlet means having a first fluid inlet opening located at a position spaced above said bottom wall and below said top wall, said chamber having an upper chamber portion located above said first inlet opening, and a lower chamber portion located below said first inlet opening, a second fluid inlet means having a second fluid inlet opening located below said first inlet opening at an inlet location at a lower part of said lower chamber portion;

b. a first hydraulic power outlet means;

c. a second hydraulic power outlet means;

d. a pump means to draw fluid from the reservoir and to deliver fluid to the first and second power outlet means;

e. a first supply isolation valve having a first position and a second position, and being operatively connected to the first and second inlet means and to the pump means, said supply isolation valve in its first position delivering fluid from said first inlet means to the pump means, said supply isolation valve in its second position delivering fluid from the second inlet means to the pump means;

f. a second pressure isolation valve operatively connected to the pump means and having a first position and a second position, said pressure isolation valve in its first position permitting flow from the pump means to the first power outlet means, and in its second position blocking flow

from the pump means to the first power outlet means, while permitting flow from the pump means to the second power outlet means;

g. fluid level monitoring means to detect when fluid level in said chamber is at or below a predetermined caution level and to produce a corresponding low level signal;

h. control menas to become operative in response to said low level signal to move at least said pressure isolation valve to its second position;

whereby in the event of fluid loss in the system, said pressure isolation valve in its second position is able to alleviate loss of fluid for said pump means.

4,704,866

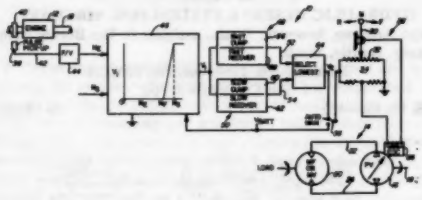
AUTOMATIC TRAVEL SPEED CONTROL FOR A HARVESTING MACHINE

H. Allen Myers, Ames, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 617,569, Jun. 4, 1984, abandoned. This application May 2, 1985, Ser. No. 730,667

Int. Cl.[4] F16H *39/46*

U.S. Cl. 60—449 **10 Claims**



1. An engine driven motor controlled system utilizing a control signal for controlling the speed of the motor, a speed control for providing said control signal comprising:

means for sensing a change in the engine speed;

means responsive to a change in the engine speed as sensed by said sensing means for providing a first command signal having an amplitude which varies at a fast rate;

means responsive to a change in the engine speed as sensed by said sensing means for providing a second command signal having an amplitude which varies at a slow rate; and

means for selecting portions of the first and second command signals to form a control signal which causes the speed of the motor to decrease at a fast rate in response to a decrease in the engine speed and in response to a subsequent increase in the engine speed, the control signal causing the speed of the motor to increase at a fast rate until the first command signal equals the second command signal at which time said control signal causes the speed of the motor to increase at a slow rate.

4,704,867

HYDRAULIC BRAKE BOOSTER WITH CAM AND LEVER RATIO CHANGER

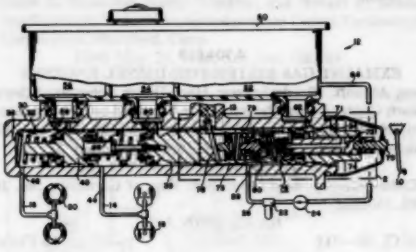
Arthur K. Brown, Jr., South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Dec. 9, 1985, Ser. No. 806,300

Int. Cl.[4] B60T *13/20*

U.S. Cl. 60—554 **14 Claims**

1. A brake booster having a housing with at least one outlet communicating with a brake, a piston movably disposed within the housing between a pressure chamber and a work chamber, an input assembly to control communication of fluid pressure to the work chamber wherein the fluid pressure biases the piston to move from a rest position to a braking position, a valve assembly operable in reponse to movement of the input assembly, and an inlet formed by the housing to communicate fluid pressure to the valve assembly, characterized in that the brake booster comprises a valve housiing disposed between said piston and input assembly and the valve assembly disposed within the valve housing, the valve housing including an actuator part, the piston includiing a cam, the booster including lever means disposed between the cam and actuator part, a



radial passage disposed within the housing of said booster, and the lever means pivotally attached to plug means disposed within said passage, displacement of the input assembly effecting operation of the valve assembly and an increased displacement of the piston by means of the actuator part, lever means and cam.

4,704,868

APPARATUS FOR THE EXPANSION OF PRESSURIZED, PULSATING EXHAUST GASES, MORE ESPECIALLY THE EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE

Oskar Schatz, Gauting, Fed. Rep. of Germany, assignor to Helmut Lamprecht, Fed. Rep. of Germany

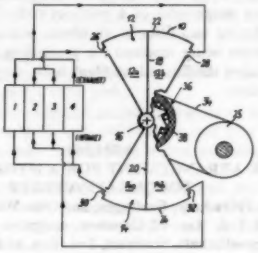
PCT No. PCT/DE84/00138, § 371 Date Mar. 5, 1985, § 102(e) Date Mar. 5, 1985, PCT Pub. No. WO85/00404, PCT Pub. Date Jan. 31, 1985

PCT Filed Jul. 2, 1984, Ser. No. 712,711

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1983, 3323959

Int. Cl.[4] F02B *37/00*

U.S. Cl. 60—620 **3 Claims**



1. An apparatus for expanding pressurized, pulsating exhaust gases of an internal combustion engine having an output drive, comprising:

at least two expansion chambers for enabling expansion of said pressurized pulsating exhaust gases;

a piston surface in each of said expansion chambers oscillating in response to said pressurized pulsating exhaust gases;

an output drive connected to said oscillating piston surfaces; and

a directional clutch means associated with said piston output drive and said output drive of said internal combustion

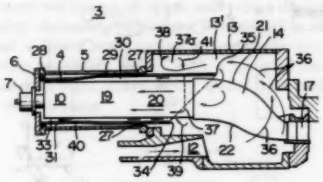
engine such that said piston output drive transmits force to said output drive of said internal combustion engine.

4,704,869

GAS TURBINE COMBUSTOR

Nobuyuki Iizuka; Fumiyuki Hirose; Isao Sato, and Yoji Ishibashi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 617,918, Jun. 6, 1984, abandoned. This application Sep. 17, 1986, Ser. No. 908,662
Claims priority, application Japan, Jun. 8, 1983, 58-100730
Int. Cl.[4] F02C *1/00*; F02G *3/00*
U.S. Cl. 60—751 **1 Claim**



1. In a gas turbine combustor including a plurality of burner units arranged around an axis of a compressor, each burner unit having an inner tube provided with air ports formed in the wall thereof, an outer tube surrounding said inner tube, a fuel nozzle for supplying a fuel into a head portion of said inner tube, a tail tube for guiding combustion gases produced in said inner tube to stationary blades of an associated gas turbine, an annular air passage formed between said inner tube and said outer tube, an annular chamber formed around said tail tube and communicating with said annular air passage through a substantially circular air inlet, and means for providing communication between an air outlet of said compressor and said annular chamber, said communication means being nearer to the compressor axis, radially thereof, then said inner tube, said air inlet including first and second areas, said first area being more remote from said axis, radially thereof, than said second area, and a flow-uniformalizing tube disposed adjacent to said air inlet to said annular passage and around said inner tube and extending into said annular chamber, said flow-uniformalizing tube having an end extremity disposed in said annular chamber, said end extremity being generally oblique relative to the axis of said inner tube and arranged such that said flow-uniformalizing tube extends deeper into said annular chamber in said first area of said air inlet than in said second area thereof to impart a greater flow resistance to the flow of air in said first area of said air inlet than in said second area of said air inlet.

4,704,870

THERMOELECTRIC COOLER

Shlomo Beitner, Chicago, Ill., assignor to Vapor Corporation, Chicago, Ill.

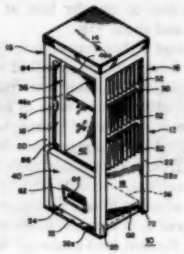
Continuation-in-part of Ser. No. 601,994, Apr. 19, 1984, Pat. No. 4,627,242. This application May 19, 1986, Ser. No. 865,249
Int. Cl.[4] F25B *21/02*
U.S. Cl. 62—3 **20 Claims**

1. A thermoelectric cooler, having

a storage compartment with insulated walls having inner thermally conductive portions, thermoelectric means coupled to said conductive portions for cooling the interior of said storage compartment, said walls forming

an access opening on one side opposite a spaced apart, fixed wall of a size substantially matching that of said access opening; and

an insulated door comprising; means supporting said door for vertical movement relative to said compartment between a first position closing said access opening and a second position open and spaced away from said access opening adjacent an edge thereof allowing access to the interior of said compartment over the whole area of said access opening said door occupying a first vertical space in said closing position and occupying a substantially reduced vertical space in said open position;



first means for securing said door tightly against adjacent edges of said walls surrounding said access opening when said door is in said first position;

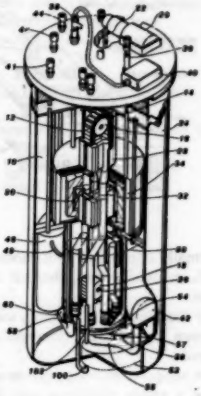
second means for biasing said door toward said second position away from first position whereby spaced required for said door is minimized.

4,704,871

MAGNETIC REFRIGERATION APPARATUS WITH BELT OF FERRO OR PARAMAGNETIC MATERIAL

John A. Barclay, Madison; Walter F. Stewart, Marshall, both of Wis.; Michael D. Henke, and Kenneth E. Kalash, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 3, 1986, Ser. No. 848,001
Int. Cl.[4] F25B *21/02*
U.S. Cl. 62—3 **26 Claims**



1. An about 12 to about 77K refrigeration apparatus comprising:

a belt disposed in a loop around at least two wheels, with at least one wheel being a drive wheel;

ferromagnetic or paramagnetic porous material carried by said belt, said material comprising at least one substance, said substance having a Curie temperature between 15K and 85K;

a magnetic field generating means disposed to produce a

magnetic field surrounding at least one portion of said loop with said magnetic field essentially parallel to the direction of movement of said belt while said belt is in said magnetic field;

means for driving said drive wheel;

a fluid effective to transfer heat at temperatures between about 12 and about 85K;

first and second higher temperature fluid manifolds directing said fluid from said first manifold adjacent to first edge of said material, through said material into said second manifold adjacent to second edge of said material, while said material is in a region of greater magnetic field;

first and second lower temperature fluid manifolds directing said fluid from first manifold adjacent to said second edge of said material, through said material to said second manifold adjacent to said first edge of said material, while said material is in a region of lesser magnetic field;

at least one thermal load exchange means;

a heat rejection exchange means; and

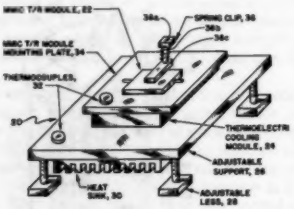
means for pumping and transporting fluid from said heat rejection exchange means through said first and second higher temperature manifolds to said thermal load exchange means, from said thermal load exchange means through said first and second lower temperature manifolds, then back to said heat rejection means.

4,704,872

THERMALLY CONTROLLED T/R MODULE TEST APPARATUS

Edward J. Jones, Rome, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 25, 1986, Ser. No. 934,585
Int. Cl.[4] F25B *21/02*
U.S. Cl. 62—3 **7 Claims**



1. A thermally controlled T/R module test apparatus for a testing T/R module during thermal cycling comprising in combination:

means for thermoelectric cooling, said thermoelectric cooling means generating a temperature differential of 80° centigrade,

means for support, said support means being adjustable to provide a stable platform, said thermoelectric cooling means positioned atop said support means, and,

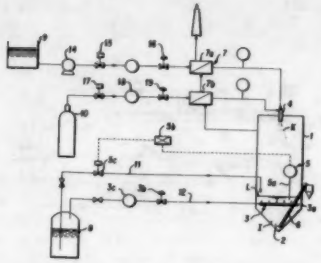
a mounting plate positioned atop said thermoelectric cooling means, said mounting plate including a means for holding, said holding means securing said T/R module to said mounting plate, said thermoelectric cooling means drawing excess heat from said mounting plate and said T/R module to maintain it at some predetermined temperature during test measurements, said thermoelectric cooling means transferring said excess heat to said support means for dissipation.

4,704,873

METHOD AND APPARATUS FOR PRODUCING MICROFINE FROZEN PARTICLES

Sekiji Imaike, Osaka; Takeki Hata, Kobe, and Norio Yamazaki, Itami, all of Japan, assignors to Taiyo Sanso Co., Ltd., Osaka, Japan

Filed Nov. 5, 1986, Ser. No. 927,039
Claims priority, application Japan, Nov. 14, 1985, 60-255496; Jul. 23, 1986, 61-173317
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—64 **18 Claims**



1. A method of producing microfine frozen particles, comprising:

atomizing a mixture of a liquid and a gas and directing it toward a refrigerant liquid contained in a vessel so that paticles of the mixture may disintegrate into smaller particles because of the gaseous expansion of the gas in each particle and between the particles, and fall onto the surface of the refrigerant liquid

substantially freezing the smaller particles in contact with the surface of the refrigerant liquid;

making ripples on the surface of the refrigerant liquid by imparting kinetic energy thereto so that the frozen particles sink efficiency from the surface of the refrigerant liquid and, further, are prevented from adhering to one another to form a film; and,

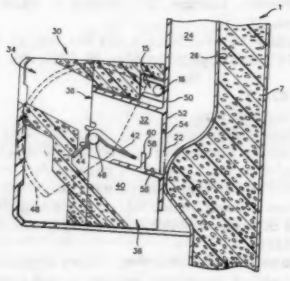
collecting the frozen particles out of the refrigerant liquid in the vessel for disposal outside the vessel.

4,704,874

HOUSEHOLD REFRIGERATOR AIR FLOW SYSTEM

James B. Thompson, and Brent A. Junge, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Sep. 9, 1986, Ser. No. 905,241
Int. Cl.[4] F25D *17/08*
U.S. Cl. 62—187 **7 Claims**



1. In a refrigerator having a refrigeration system including a

condenser, evaporator, compressor, and thermostatic control an air flow system comprising:

a freezer compartment at the top of the refrigerator,

a fresh food compartment below the freezer compartment and being separated therefrom by a partition,

an area above the fresh food compartment containing the evaporator,

a fan for circulating air through the evaporator, said fan cycling on when the compressor is operating and off when the compressor is not operating,

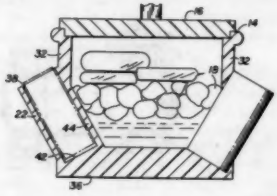
an air duct having an upper end to receive cold air from the evaporator and a lower end having an air flow control assembly located in the fresh food compartment for discharging cold air into the fresh food compartment, said air duct lower end having an upper wall with a downwardly projecting depending stationary flange with a terminal end and a lower wall having an upwardly projecting depending stationary flange with a terminal end, said terminal ends of the flanges being spaced from each other in the vertical plane.

4,704,875

BEVERAGE COOLER

David R. Kieler, 183 Winterhaven Cir., Palm Desert, Calif. 92260

Filed Nov. 10, 1986, Ser. No. 928,564
Int. Cl.[4] F25D *3/08*
U.S. Cl. 62—372 **2 Claims**



1. A beverage cooler comprising:

a housing member of generally rectangular configuration having a bottom horizontal wall, a plurality of generally vertical side and end walls integrally formed with the bottom horizontal wall to define an enclosure having a top opening for inserting coolant and consumable items in said cooler;

a cover member positioned on said vertical walls to cover said cooler and form an enclosed closure; and

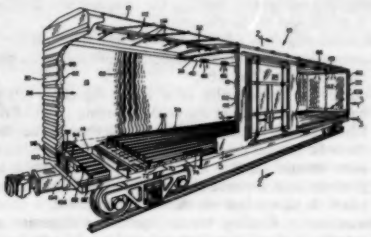
at least one sleeve member whose axis extends at an angle through the plane of at least one of said vertical wall members, said sleeve member forming an integral outer surface with said wall members for preventing cooled air from leaking from the cooler, said sleeve member enabling beverage containers to be inserted therein from the exterior of said housing member for enabling the containers to be cooled by being adjacent to cool air in the interior of said beverage cooler, the sleeve member portion being integral with the outer surface extending into the interior portion of said housing defining said enclosure, and the sleeve member having a portion exterior of said wall member which is open for enabling a beverage container to be inserted into said sleeve, the end of said beverage container initially inserted into said sleeve abutting the sleeve member portion integral with said outer surface.

4,704,876

CRYOGENIC REFRIGERATION SYSTEM

Ralph P. Hill, 10170 S.W. Kable St., Tigard, Oreg. 97224

Filed Aug. 12, 1986, Ser. No. 895,875
Int. Cl.[4] F25D *3/12*
U.S. Cl. 62—388 **6 Claims**



1. In a container adapter to be maintained in a refrigerated condition from the sublimation of carbon dioxide snow the combination comprising:

a storage area defined by a floor, a pair of opposed side walls, a pair of opposed end walls, and a ceiling means;

an insulated roof positioned above said ceiling means and defining therewith a compartment for supporting a supply of carbon dioxide snow, said compartment extending substantially the full length of said car;

means in said compartment for forming carbon dioxide snow and means for connecting said carbon dioxide snow forming means to a supply of liquid carbon dioxide;

a plurality of openings through said ceiling means adjacent each of said side walls and end walls for permitting the flow of sublimated carbon dioxide gas from said compartment;

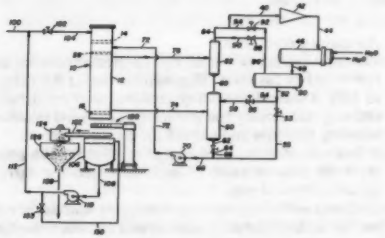
each of said walls being corrugated to define a plurality of channels therein open-sided toward the interior of the container whereby said carbon dioxide gas may flow from said openings in said ceiling means downwardly through said channels between said walls and a product load disposed in said container toward said floor.

4,704,877

APPARATUS AND METHOD OF FREEZING A FEED LIQUID

Yuksel A. Selcukoglu, Naperville, Ill., assignor to CBI Industries, Inc., Oak Brook, Ill.

Filed Oct. 2, 1986, Ser. No. 914,278
Int. Cl.[4] B01D *9/04*; C02F *1/22*
U.S. Cl. 62—532 **22 Claims**



10. A method of freezing a liquid which comprises:

producing a falling film of a cold liquefied refrigerant, at a temperature below the freezing point of a feed liquid, on the exterior surface of a vertical tube extending through a chamber as the feed liquid flows downwardly in the tube

to cool the feed liquid by heat exchange with the cold liquid refrigerant to a temperature low enough to form a solid tubular shaped product of frozen feed liquid adhering to the tube;

collecting refrigerant vapor and liquid in the chamber, sending it to a refrigeration means and recycling it into cold liquefied refrigerant for reuse in the freezing of feed liquid;

collecting refrigerant liquid in the chamber and recirculating it to the top of the chamber;

discontinuing flow of feed liquid to the tube interior;

discontinuing flow of cold liquefied refrigerant on the exterior surface of the tube;

producing a falling film of a warm liquefied refrigerant, having a temperature above the freezing point of the feed liquid, on the exterior surface of the tube to thereby melt the solid tubular product of frozen feed liquid adjacent the tube internal surface and thereby free the solid tubular product from the tube so the solid tubular shaped product can slide down and out the end of the tube;

discontinuing feeding warm liquefied refrigerant on the exterior surface of the tube after the solid tubular shaped product is removed from the tube;

collecting warm liquefied refrigerant vapor and liquid in the chamber, sending it to a refrigeration means and recycling it into warm liquefied refrigerant for reuse in the said process;

collecting warm liquefied refrigerant in the chamber for reuse in the method;

reinstituting producing a falling film of a cold liquefied refrigerant on the exterior surface of the tube as feed liquid flows downwardly in the tube to again form a solid tubular shaped product of frozen feed liquid adhering to the tube; and

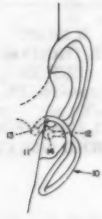
continuing to repeat the process as described.

4,704,878

EARRING

Pepe Saraga, 13910 Old Harbor La. #106, Marina del Rey, Calif. 90392

Filed Aug. 22, 1985, Ser. No. 768,825
Int. Cl.[4] A44C *7/00*
U.S. Cl. 63—14 R **7 Claims**



1. An earring comprising:

a connector having two ends, said connector coupled at one end to only a first mounting member and at the other end to only a second mounting member, said connector for defining said earring and maintaining a spacial relationship between said first and second mounting members;

said first mounting member contacting said ear at a point on the back outer portion of said ear when the earring is mounted on said ear;

said second mounting member contacting said ear at a point on the inside of the antitragus of said ear when the earring is mounted on said ear;

the ends of said first and second mounting members separated by a distance, each of said mounting members having a length at least one-quarter of said distance;

said second mounting member extending away from said first mounting member colinearly with a line extending from the origin of an imaginary three dimensional XYZ coordinate system and disposed on the surface of a right circular cone having its apex at said origin, wherein said first mounting member lies upon the positive X axis of said imaginary three dimensional XYZ coordinate system and said origin lies at the intersection of the lines extending through said first and second mounting members;

said cone being defined by the equation $KX=-\sqrt{Y^2+Z^2}$ where X does not exceed zero and where K is in the range from and including 1.0 to 3.73;

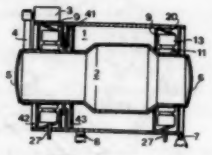
whereby said earring is maintained on said ear without piercing of said ear and without the necessity of application of compressive force to said ear.

4,704,879

TREATMENT MACHINE WITH ROTATABLE TREATMENT DRUM

Alfred Christ; Helmuth Lehmann, both of Zurich, and Leonhard Spiewok, Wallisellen, all of Switzerland, assignors to Sulzer-Escher Wyss Ltd, Zurich, Switzerland

Filed Feb. 20, 1985, Ser. No. 703,506
Claims priority, application Switzerland, Mar. 1, 1984, 997/84
Int. Cl.[4] D06F *21/04*
U.S. Cl. 68—140 **16 Claims**



1. A machine for treating bulk material comprising

a. a housing containing a treatment drum supported for rotation by at least two axially spaced radial bearing means,

b. each radial bearing means including a bearing surface on the drum and a circumferential series of radially arranged hydrostatic support elements acting between the associated bearing surface and the housing and supporting the drum in all radial directions,

c. each hydrostatic support element comprising a radially displaceable support body, and adjustable, resilient intermediate member acting between the support body and the housing, and a bearing plate displaceable radially relatively to the support body and defining therewith a pressure chamber, and having a surface facing the associated bearing surface of the drum which contains at least one pressure pocket,

d. each radial bearing means also including means for supplying hydraulic fluid under pressure and at equal flow rated to the pressure chambers and pockets of the hydrostatic support elements;

e. variable speed drive means for rotating the drum; and

f. control means which measures the dynamic load applied to the housing by the rotating drum and regulates the drive means in response thereto.

4,704,880

REMOVABLE CAM-LOCK UNIT AND DEAD-BOLT MECHANISM

Siegfried Schlindwein, 51 St. Mary Dr., Succasunna, N.J. 07876

Continuation of Ser. No. 743,310, Jun. 10, 1985, abandoned.
This application Dec. 8, 1986, Ser. No. 940,213
Int. Cl.[4] E05B 63/14, 9/04; E05G 1/04; E05C 1/12
U.S. Cl. 70—120 10 Claims

1. Dead-bolt locking apparatus for releasably locking a door of an enclosure in closed position, said apparatus including

a removable cam-lock unit having a key, a key-controlled cylinder lock, said cylinder lock having a lock cylinder rotatable about its axis, said cam-lock unit comprising a body portion containing said lock cylinder, and a latch operated by said lock cylinder between a projecting locking position and a position retracted from said locking position in dependence on indexing of the lock cylinder about its axis to first and second positions, respectively, said body portion fixedly bearing a pair of first cam elements directed oppositely relative to the axis of said cylinder, and said latch moving relative to said body portion and relative to said first cams between said locking position and said retracted position, and

a dead-bolt mechanism having a base providing a cavity shaped for admitting and guiding said cam-lock unit via an outer end of the cavity and along the axis of the lock cylinder, said base including an abutment which cooperates with said latch so as to prevent removal of said removable cam-lock unit from said base when insertion of the cam-lock unit into said cavity has been completed and when, thereafter, the cylinder lock has been operated to cause said latch to assume its locking position in cooperation with the abutment, said dead-bolt mechanism including a pair of oppositely reciprocable locking bolts having retracted positions and projected positions, said locking bolts having respective second cam elements adjacent said cavity and cooperable with said first cam elements, respectively, and spring means for biasing said locking bolts to their retracted positions and for retracting said second cam elements toward each other when the cavity is empty,

the foregoing apparatus being arranged so that the effort of inserting the cam-lock unit into the cavity develops balanced mutually opposite thrust of the first cam elements against the second cam elements as the cam-lock unit is being received in said cavity, thereby driving said locking bolts oppositely to their projecting positions, whereupon indexing of said lock cylinder by said key into its first position causes the latch to assume said locking position, thereby locking the cam-lock unit against removal from the cavity and thus locking said locking bolts in their projected positions.

4. Dead-bolt locking apparatus for releasably locking a door of an enclosure in closed position, said apparatus including

(I.) a removable cam-lock unit having (i.) a key, a key-controlled cylinder lock including a lock shell and a cylinder in the shell indexing about the axis of the cylinder in relation to said shell, (ii.) a body containing said cylinder lock, and (iii.) a latch operated by said cylinder lock between a projecting locking position and a released position retracted from said locking position in dependence on indexing of the cylinder about its axis to first and second positions of the cylinder, respectively, and (iv.) a pair of first cam elements fixedly disposed externally on opposite sides of that portion of said body which contains the cylinder lock, said latch moving relative to said body and relative to said cams between said locking position and said released position, and

(II.) a dead-bolt mechanism having (i.) base means providing a cavity shaped for guiding and admitting said cam-lock unit via an outer end of the cavity along the axis of said cylinder into the cavity and for total removal of the cam-lock unit from the cavity, (ii.) an abutment forming part of said base means, said abutment cooperating with said latch when insertion of the cam-lock unit into said cavity has been completed and when, thereafter, the cylinder lock has caused said latch to assume its locking position so as to prevent removal of said removable cam-lock unit from said base means, (iii.) a pair of oppositely reciprocable locking bolts having retracted positions and projected positions, said locking bolts having respective second cam elements adjacent said cavity and cooperable with said first cam elements, respectively, for driving said locking bolts to their projected positions when the cam-lock unit is being inserted into said cavity, and spring means for biasing said locking bolts to their retracted positions and for retracting said second cam elements toward each other when the cavity is empty,

the foregoing apparatus being arranged so that the effort of inserting the cam-lock unit into the cavity develops balanced mutually opposite thrust of the first cam elements against the second cam elements as the cam-lock unit is being received in said cavity, thereby projecting said locking bolts oppositely to their door-securing positions, whereupon indexing of said cylinder by a key into said first position causes said latch to be disposed in its locking position and in cooperation with said abutment for locking the cam-lock unit against removal from the cavity, thereby locking said locking bolts in their projected positions.

9. Dead-bolt locking apparatus for releasably locking a door of an enclosure in closed position, said apparatus including

a removable cam-lock unit having a key, a key-controlled cylinder lock, said cylinder lock including a cylinder, said cam-lock unit comprising a body portion containing said cylinder, said cylinder indexing about its axis relative to said body portion, and a latch operated by said cylinder between a projecting locking position and a released position retracted from said locking position in dependence on indexing of the cylinder to first and second positions, respectively, said body portion fixedly and externally bearing a first cam element and said latch moving relative to said body portion and relative to said first cam element between said locking position and said released position, and

a dead-bolt mechanism having base means providing a cavity shaped for admitting and guiding said cam-lock unit into the cavity via an outer end of the cavity along the axis of said cylinder and for total removal of the cam-lock unit from the cavity, said dead-bolt mechanism providing an abutment which cooperates with said latch so as to prevent removal of said removable cam-lock unit from said base means when insertion of the cam-lock unit into said cavity has been completed and when, thereafer, the cylinder has been indexed and has thereby caused said latch to assume its locking position, a locking bolt having a retracted position and a projected position, said locking bolt having a second cam element adjacent said cavity and cooperable with said first cam element, and spring means for biasing said locking bolt to its retracted position and for biasing said locking bolt to its retracted position and

for retracting said second cam element when the cavity is empty,

the foregoing apparatus being arranged so that the effort of inserting the cam-lock unit into the cavity develops thrust of the first cam element against the second cam element in the direction to cause the locking bolt to become projected as the cam-lock unit is being received in said cavity, whereupon indexing of said cylinder in said body portion by said key into said first position causes said latch to be disposed in its projecting locking position and in cooperation with said abutment for locking the cam-lock unit against removal from the cavity, thereby locking said locking bolt in its projected position.

4,704,881

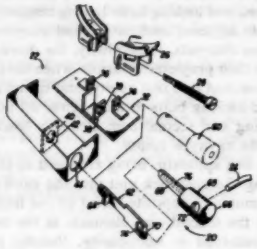
BARREL LOCK ASSEMBLY

Clifford E. Sloop, Sr., P.O. Box 1574, Columbus, Ga. 31902

Filed Dec. 2, 1985, Ser. No. 803,561

Int. Cl.[4] B65D *55/14*

U.S. Cl. 70—158 **9 Claims**



1. A barrel lock assembly for use in combination with a lock retaining means to secure a lock housing at the access point of a utility meter, said housing having an aperture for receiving the assembly, said assembly comprising a first bar member having stop means disposed near the distal end thereof for engaging the lock retaining means, a second bar member disposed generally parallel with said first bar member and having head means at one end thereof with a closed end and an open end for receiving the proximal end of said first bar member, said first bar member and said head means having aligned apertures formed therein for receiving a securing means for keeping said assembly together.

4,704,882

DOOR HANDLE LATCH AND LOCK MECHANISM

Kunihiko Takasaki, Chiba, Japan, assignor to Takigen Seizou Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 615,947, May 31, 1984, abandoned.

This application May 7, 1986, Ser. No. 861,636

Claims priority, application Japan, Nov. 5, 1983, 58-171746[U]

Int. Cl.[4] E05C *1/12*

U.S. Cl. 70—215 **4 Claims**

1. A handle latch and lock mechanism for a door, comprising:

a body 1 which is installed on a door panel A;

a handle grip 2 which is connected to said body 1 by a first pivot pin 8;

a latch 5 which is retractably mounted on said body 1;

an acuating level 7 which is connected in said body 1 by said first pivot pin 8 and which is mounted unitarily with said handle grip 2 by a second pivot pin 13, a front end part 7*a* of the actuating lever 7 abutting on a third pivot pin 9 fixed on a rear end 5*a* of the latch 5 so as to retract said latch 5 owing to rotating of the handle grip 2 about said first pivot pin 8;

a compression spring 6 which is interposed between said body 1 and said latch 5 so as to urge the latch 5 to slide in an advancing direction;

a bottom plate 18 which is fixed to said body 1;

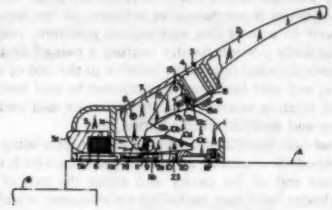
a lock 3 which is mounted on said handle grip 2 and which has a lock cam 15 secured to a rotor 4, said latch 5 becoming retractable after turning the lock cam 15;

a reset lever 12 which is pivotally connected to said handle grip 2 by said second pivot pin 13 and which has a protrusive piece 12*c* formed at a rear end thereof, said protrusive piece 12*c* abutting on an eccentric projection 15*a* of said lock cam 15;

a lock lever 10 which is connected to said rear end 5*a* of the latch 5 by said third pivot pin 9 and a rear end part 10c which is engageable with a receiving portion 20 protrusively provided on said bottom plate 18 so as to check the retracting of said latch 5;

a reset spring 14 which is interposed between an inner wall 12*a* of the reset lever 12 and a rear vertical wall 7*b* of said actuating lever 7 and which pushes said protrusive piece 12*c* of the reset lever 12 against said lock cam 15 to hold an engagement therebetween and also pushes a front end part 12*b* of said reset lever 12 on a fore surface part 10*b* of said lock lever 10 to hold an engagement between said rear end part 10c of the lock lever 10 and said receiving portion 20 of the bottom plate 18;

a leaf spring 11 which is secured at its front end 11*a* to said bottom plate 18 and which pushes up said lock lever 10 at its rear end 11*b* so as to release said engagement between said rear end part 10c of the lock lever 10 and said receiving portion 20 when said protrusive piece 12*c* of the reset



lever 12 is pushed by an eccentric projection 15*a* of said lock cam 15 owing to a rotation of the lock cam 15 and thereby said reset lever 12 is rotated;

whereby said rear end part 10c of the lock lever 10 disengages from said receiving portion 20 of the bottom plate 18, and the reset lever 12 pushed by said lock lever 10 is rotated about said second pivot pin 13 and then the handle grip 2 is rotated about said first pivot pin 8, and thereby said latch 5 is retracted with said actuating lever 7 so as to render the door openable.

4. A handle latch and lock mechanism for a door, comprising:

a body 1 which is installed on a door panel A;

a handle grip 2 which is connected to said body 1 by a first pivot pin 8;

a latch 15 which is retractably mounted on said body 1;

an actuating lever 7 which is connected in said body 1 by said first pivot pin 8 and which is mounted unitarily with said handle grip 2 by a second pivot pin 13, a front end part 7*a* of the actuating lever 7 abutting on a third pivot pin 9 fixed on a rear end 5*a* of the latch 5 so as to retract said latch 5 owing to rotating of the handle grip 2 about said first pivot pin 8;

a coiled compression spring 6 which is interposed between said body 1 and said latch 5 so as to urge the latch 5 to slide in an advancing direction;

a bottom plate 18 which is fixed to said body 1 and which has therein a push rod hole 23;

a push rod 24 which extends inside of the door through the

push rod hole **23** and which when pushed from inside of the door retracts the latch **5** against the urging of said spring **6**; and

a lock **3** which is mounted on said handle grip **2** and which has a lock cam **15** secured to a rotor **4**, said latch **5** becoming retractable after turning the lock cam **15**;

a reset lever **12** which is pivotally connected to said handle grip **2** by said second pivot pin **13** and which has a protrusive piece **12***c* formed at a rear end thereof, said protrusive piece **12***c* abutting on an eccentric projection **15***a* of said lock cam **15**;

a lock lever **10** which is connected to said rear end **5***a* of the latch **5** by said third pivot pin **8** and a rear end part **10***c* which is engageable with a receiving portion **20** protrusively provided on said bottom plate **18** so as to check the retracting of said latch **5**;

a reset spring **14** which is interposed between an inner wall **12***a* of the reset lever **12** and a rear vertical wall **7***b* of said actuating lever **7** and which pushes said protrusive piece **12***c* of the reset lever **12** against said lock cam **15** to hold an engagement therebetween and also pushes a front end part **12***b* of said reset lever **12** on a fore surface part **10***b* of said lock lever **10** to hold an engagement between said rear end part **10***c* of the lock lever **10** and said receiving portion **20** of the bottom plate **18**;

a leaf spring **11** which is secured at its front end **11***a* to said bottom plate **18** and which pushes up said lock lever **10** at its rear end **11***b* so as to release said engagement between said rear end part **10***c* of the lock lever **10** and said receiving portion **20** when said protrusive piece **12***c* of the reset lever **12** is pushed by an eccentric projection **15***a* of said lock cam **15** owing to a rotation of the lock cam **15** and thereby said reset lever **12** is rotated;

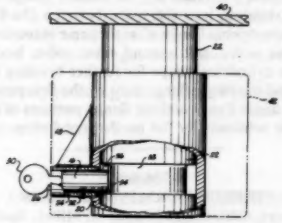
whereby said rear end part **10***c* of the lock lever **10** disengages from said receiving portion **20** of the bottom plate **18**, and the reset lever **12** pushed by said lock lever **10** is rotated about said second pivot pin **13**, and then the handle grip **2** is rotated about said first pivot pin **8**, and thereby said latch **5** is retracted with said actuating lever **7** so as to render the door openable.

4,704,883

KING PIN LOCK

James R. Dykes, 540 E. 60th St., Savannah, Ga. 31405

Filed Jan. 27, 1986, Ser. No. 822,650
Int. Cl.[4] F16B *41/00*
U.S. Cl. 70—232 **6 Claims**



1. A locking device receivable about an annularly extending groove defined in a trailer king pin for preventing insertion of the trailer king pin into a tractor fifth wheel coupling, comprising:

a substantially cylindrical sleeve having a substantially cylindrical interior surface defining a king pin-receiving opening therethrough receivable about the trailer king pin; said sleeve having a substantially cylindrical bore extending radially therethrough into said king pin-receiving opening;

a substantially cylindrical locking unit carried in said bore for radial sliding movement relative to said sleeve into and out of said king pin-receiving opening, said locking unit having an engagement end movable into and out of the annularly extending groove;

a substantially cylindrical locking unit housing surrounding said bore and extending outwardly from said sleeve for carrying said locking unit for sliding movement therein; and

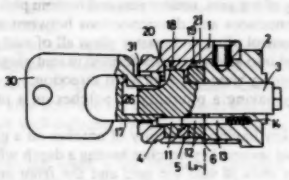
an extendable retaining pin provided in said engagement end of said locking unit, said retaining pin being radially extendable therefrom within said king pin-receiving opening for retaining, through contact with said substantially cylindrical interior surface of said sleeve adjacent the trailer king pin, said locking means in the annularly extending groove by preventing extraction of said locking unit through said bore, so that when said sleeve is received about the trailer king pin, said extendable retaining pin is receivable and outwardly extendable in said annularly extending groove defined in the king pin, and said locking unit is movable into the annularly extending groove and retainable therein by said extendable retaining pin.

4,704,884

DOUBLE-ACTING LOCKING DEVICE FOR JOINT CONTROL

Naoyuki Sugimoto, Koganei, Japan, assignor to Takigen Seizou Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 611,330, May 17, 1984, abandoned. This application Nov. 5, 1986, Ser. No. 928,599
Claims priority, application Japan, May 21, 1983, 58-89618
Int. Cl.[4] E05B *27/08, 35/08*
U.S. Cl. 70—337 **5 Claims**



1. A double-acting locking device for joint control, comprising:

a stationary plug provided with a plurality of axial pin holes;

a cylinder mounted coaxially on a front portion of said stationary plug;

a rotary plug fitting rotatably into said cylinder, which is provided with an actuating shaft on a rear face thereof and a plurality of axial pin holes;

a control plug fitting rotatably into said cylinder in contact with said rear face of said rotary plug and which is provided with a plurality of axial pin holes, said control plug defining together with said rotary plug a first shear line therebetween;

a master plug fitting rotatably into said cylinder in contact with both a rear face of said control plug and a front face of said stationary plug, and which is provided with a plurality of axial pin holes, said master plug defining together with said control plug a second shear line therebetween, and together with said stationary plug a master shear line therebetween;

a plurality of top pins, master pins, and bottom pins inserted together into the axial pin holes of said rotary plug, said control plug, said master plug and said stationary plug;

a plurality of springs fitting in the pin holes of said stationary plug so as to bias said top pins, said master pins and said bottom pins forward;

a first key having a plurality of notches on a pin-pushing face, said first key notches having a depth which brings the rear ends of said top pins and the front ends of said

master pins into alignment with said first shear line so that only said rotary plug can rotate;

a second key having a plurality of notches on a pin-pushing face, said second key notches having a depth which brings the rear ends of said top pins and the front ends of said master pins into alignment with said second shear line so that only said rotary plug and said control plug can rotate; and

a master key which brings the rear ends of said master pins and the front ends of said bottom pins into alignment with said master shear line so that said rotary plug, said control plug, and said master plug can rotate;

wherein said control plug is provided with projections on its front and rear faces, respectively, thereof;

said rotary plug has a recess in the rear face thereof into which the front face projection of said control plug can fit loosely; and said master plug has a recess in the front face thereof into which the rear face projection of said control plug can fit loosely, so that the directions in which said actuating shaft is rotated by said first and second keys are made to be opposite to each other according to the way in which side walls of said projections come into contact with side walls of said recesses, and wherein said control plug has thickness equal to the depth difference of the notches in said first and second keys.

5. A double-acting locking device of an axial pin tumbler type for joint control, including:

an outer cylinder containing a rotary plug, a control plug, a master plug and a stationary plug each disposed in contact facing with one another within said cylinder, said rotary plug being provided with an integral actuating shaft extending from a rear central portion of said rotary plug to provide a drive portion;

a plurality of top pins, master pins and bottom pins for effecting connections and disconnections between said rotary plug, control plug, and master plug, all of said pins being disposed into axial pin holes formed in said plugs, said pins being spring-biased in a forward direction;

a first key having a pllurality of notches on a pin pushing face.

a second key having a plurality of notches on a pin pushing face, said second key notches having a depth which brings the rear ends of said top pins and the front ends of said master pins into alignment with a second shear line so that only said rotary plug and said control plug can rotate, and a master key adapted for bringing the rear ends of said master pins and the front ends of said bottom pins into alignment with a master shear line so that said rotary plug, said control plug, and said master plug can rotate;

wherein said control plug is provided with projections on its front and rear faces, which projections loosely interfit into a rear face recess on the rotary plug and a front face recess on the master plug, respectively, so that rotational direction and angles of said actuating shaft being set by said first and second keys can be controlled by action of said front and rear face projections on said control plug, on the rear face recess of said rotary plug and on the front face of said master plug, and said actuating shaft drive portion can be rotated to actuate a driving unit.

4,704,885

APPARATUS FOR MAKING CONNECTING PIPES FOR CONNECTING DUCTS

Kenji Nakajima, Osaka, Japan, assignor to Ariyoshi Nakamura, Saitama, Japan

Division of Ser. No. 836,515, Mar. 5, 1986, abandoned. This application Sep. 9, 1986, Ser. No. 906,575

Claims priority, application Japan, Mar. 8, 1985, 60-47277; Dec. 13, 1985, 60-281599

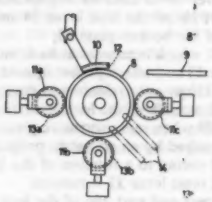
Int. Cl.[4] B21C *37/12*

U.S. Cl. 72—50 **3 Claims**

1. An apparatus for making a connecting pipe from a metal strip having undulating longitudinal edges, a single flange raised on the strip along one of said longitudinal edges and extending substantially along the full length thereof, a double flange comprising two flange portions extending along the other of said longitudinal edges and being raised along the same side of the strip as is the single flange, said two flange portions being spaced apart for forming a space therebetween open to the other side of the strip from which the flanges are raised, said apparatus comprising:

a drum for receiving the metal strip and over and around which the metal strip is wrapped with the longitudinal edges aligned so that the single flange extends into the space formed between the flange portions of the double flange for forming the connecting pipe;

a guide member having a longitudinal groove positioned adjacent a portion of the outer periphery of said drum, the guide groove of the guide member being positioned for initially receiving and guiding the double flange of the metal strip along the outer periphery of said drum and for receiving and guiding the double flange and the single flange extending into the space formed between the flange portions of the double flange after said strip is wrapped around said drum with the longitudinal edges aligned;



a guide plate adjacent the outer periphery of said drum and cooperating with said guide member for positioning the strip to be received by said drum tangentially to the outer periphery of said drum and for aligning the double flange of the strip with said groove in said guide member;

a first press roller positioned adjacent the outer periphery of said drum for receiving the double flange and the single flange extending into the space formed between the flange portions of the double flange after the same is received by said guide member, said roller having a hub having a tapered shape tapered in a direction parallel to the central axis thereof for bending the double flange and the single flange towards the metal strip; and

a second press roller positioned adjacent the outer periphery of said drum for receiving the double flange and single flange extending into the space between the flange portions of the double flange after the same is received by said first press roller, said second press roller having a hub having a cylindrical shape for further bending the double flange and the single flange bent by the first press roller so that the single flange and the flange portions of the double flange lie substantially flat on the metal strip.

4,704,886

STRETCH-FORMING PROCESS

Robert P. Evert, Gibsonia, and James A. Miller, Apollo, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 22, 1985, Ser. No. 725,897

Int. Cl.[4] B21D *7/02, 11/02;* B29C *53/08, 55/22*

U.S. Cl. 72—57 **5 Claims**

1. A method of plastically forming an elongated hollow metal member having walls capable of containing a compressible fluid under pressure, the method comprising the steps of:

providing internal support within the hollow interior of the member by exposing the hollow interior thereof to a compressible fluid medium to impose a outwardly directed force uniformly over the interior periphery thereof at a pressure insufficient to cause mechanical working of the walls of the member;

while maintaining said internal support, mechanically gripping the opposite longitudinal ends of the member and forcibly pulling said opposite ends in opposite longitudinal directions to thereby apply to the member a longitudinal tension of sufficient magnitude to exceed the elastic limit of the member and initiate elongation through plastic deformation thereof;

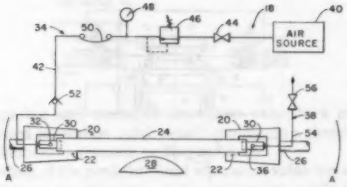
while continuing to maintain said internal support and longitudinal tension bending the member intermediate of its ends in a direction transversely of the direction of the longitudinal tension; and

relaxing said longitudinal tension, said bending load, and said internal support.

5. A method of forming an elongated, hollow, open-ended metal member having walls capable of containing a compressible fluid under pressure, the method comprising the steps of:

disposing sealing plug means in the open ends of the member to seal the hollow interior of the member from the ambient atmosphere;

supplying compressible pressure medium to the sealed interior of the member via at least one of said plug means to



impose on the member a circumferential tension load of a magnitude insufficient to result in mechanical working of the member yet sufficient to provide internal support for the walls of the member when the member is subjected to bending and stretching;

engaging the opposite longitudinal ends of the member adjacent said plug means with gripping means and pulling said gripping means in opposite longitudinal directions to superimpose on said circumferential tension a uniform longitudinal tension load of sufficient magnitude to elongate the member beyond its yield point;

simultaneously with said supplying and said pulling steps, moving said gripping means transversely of the direction of said pulling in a manner to move the member laterally into interfering contact with a forming die to impose on the member a transverse bending load of sufficient magnitude to laterally bend the member beyond its yield point;

relaxing said uniform longitudinal tension load and said bending load;

and subsequently releasing said compressible medium from the sealed interior of the hollow member to relax said circumferential tension load.

4,704,887

METHOD AND APPARATUS FOR MAKING SHELLS FOR CAN ENDS

Henry C. Bachmann; Omar L. Brown; Ermal C. Fraze; David K. Wynn, all of Dayton, and James R. Gregg, Springboro, all of Ohio, assignors to Dayton Reliable Tool & Mfg. Co., Dayton, Ohio

Continuation of Ser. No. 768,162, Aug. 22, 1985, which is a continuation of Ser. No. 571,243, Jan. 16, 1984. This application Oct. 2, 1986, Ser. No. 915,889

Int. Cl.[4] B21D *22/00, 51/44, 51/46*

U.S. Cl. 72—347 **4 Claims**

1. In a method of forming shells for use in the manufacture of can ends wherin a rounded non-circular blank is formed from a sheet of thin metal;

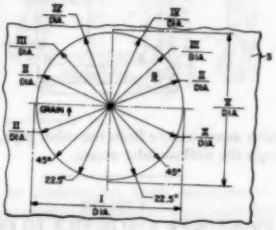
the improvement comprising

orienting the blank on the metal such that the blank has a greater width across the grain of the metal than along such grain,

then forming into the blank a substantially flat central panel and an upward-extending chuck wall about the edge of the panel to produce a partially formed shell, the junction area between the panel and the chuck wall defining a relatively large radius of curvature; and

forming into the blank a lip extending outward from the upper end of the chuck wall and generally parallel to the panel.

3. In a method of forming sheels for use in the manufacture of can ends wherein a non-circular blank having rounded corners is formed from a sheet of thin metal: the improvement comprising



orienting the blank on the metal such that the blank is oblong in a direction transverse to the grain of the metal to compensate for greater elongation of the blank along the grain during forming;

then forming in the blank a substantially flat central panel and an upward-extending chuck wall about the edge of the central panel to produce a partially formed shell, the junction area between the central panel and the surrounding chuck wall defining a relatively large radius of curvature; and

forming into the blank a lip extending outward from the upper end of the chuck wall and generally parallel to the panel.

4,704,888

BREAKSTEM FASTENER INSTALLATION TOOL

William H. Frearson, Letchworth, England, assignor to Avdel Limited, Hertfordshire, England

Filed May 5, 1986, Ser. No. 859,839

Claims priority, application United Kingdom, May 10, 1985, 8511946

Int. Cl.[4] B21J *15/20*

U.S. Cl. 72—391 **8 Claims**

1. A break stem fastener installation tool which includes:

a housing;

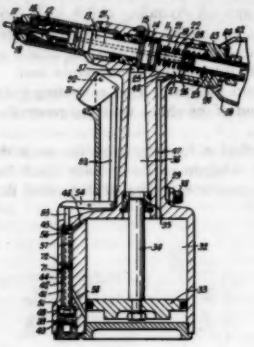
stem engaging and pulling means reciprocable with respect to the housing to install a fastener;

and an airflow ejector comprising two adjacent and axially aligned pipes which form at least part of a passageway along which broken-off stems are ejected, with airflow inlet means located at the junction of the two pipes, the relative axial position of the two pipes being adjustable so as to adjust the airflow inlet means and thus adjust the rate of airflow through the ejector;

in which one of the two adjacent and axially aligned pipes is connected to the pulling means for reciprocation therewith,

and in which the other of the pipes is connected to the housing and is adjustable axially with respect thereto so

that the relative axial position of the two pipes, at least when the stem engaging and pulling means is in a forward



position more remote from the other pipe, allows airflow through the airflow inlet means.

4,704,889

PROCEDURE AND DEVICE TO FEED A MULTIPLE-FEED STRAIGHTENING MACHINE AUTOMATICALLY DOWNSTREAM OF A COOLING PLATE

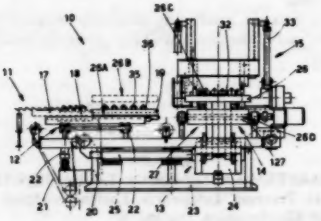
Alfredo Poloni, Ronchi dei Legionari, and Geremia Nonini, Buttrio, both of Italy, assignors to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

Filed May 7, 1986, Ser. No. 860,333

Claims priority, application Italy, May 8, 1985, 83365 A/85

Int. Cl.[4] B21D *3/02, 43/00*; B21B *39/04*

U.S. Cl. 72—428 **11 Claims**



1. A device to automatically feed sections from a cooling plate to a straightening machine, comprising:

layer-forming means to withdraw a plurality of sections from the cooling plate and deposit them side by side to thereby form a layer, said layer-forming means being co-axial to the cooling plate;

transfer means to bring said layer into alignment with the straightening machine; and

feeder means to feed said layer into the straightening machine in a controlled manner, whereby the sections of said layer are kept essentially parallel at a pre-determined distance apart, said feeder means comprising:

at least one pair of feeder rolls into which the sections can be inserted and then clamped, the distance between the centers of each pair of rollers being adjustable, at least one of said feeder rollers consisting of a plurality of elements fitted resiliently together to adapt to the contours of the sections;

a guide panel having multiple channels therein located immediately upstream of the feeder rolls, said guide panel being movable in a vertical direction to thereby clamp the sections at the pre-determined distance apart before they are inserted into the feeder rolls; and

spacing means located downstream of the feeder rolls to finally space the sections the pre-determined distance apart;

conveying means to convey said layer from said transfer means to said feeder means.

4,704,890

PRESS TOOL PROVIDED WITH A SYSTEM FOR GUIDING AND RELIEVING A METAL STRIP

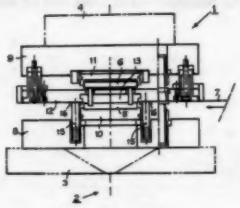
Dorice Vrignaud, La Roche Sur Yon, France, assignor to Eswein, S.A., La Roche Sur Yon, France

Filed Apr. 9, 1986, Ser. No. 849,632

Claims priority, application France, Apr. 16, 1985, 85 05714

Int. Cl.[4] B21D *43/00*

U.S. Cl. 72—428 **9 Claims**



1. A press tool provided with a system for guiding and relieving a metal strip moving through the tool between dies and punches said system comprising:

(a) a lower stay block mounted on the table of said press tool, said stay block having a plurality of vertically-oriented bores disposed on each side of the path at said metal strip;

(b) vertically movable sliding support means mounted in said bores;

(c) adjustable stop means for limiting the stroke of said support means, said stop means being detachably mounted on the upper surface of said stay block and having stroke-limiting surfaces to limit both the upward movement and the downward movement of said support means, said stop means further being adapted to be positioned on said stay block in at least two different orientations to provide at least two different, predetermined and fixed stop positions;

(d) guide and relieving means for guiding and relieving said metal strip detachably mounted on the upper portion of said sliding support means.

4,704,891

METHOD AND MATERIALS FOR CALIBRATING FLOW CYTOMETERS AND OTHER ANALYSIS INSTRUMENTS

Diether J. Recktenwald; Rickie S. Kerndt, both of Cupertino; Michael R. Loken, Los Altos, and Chia H. Chen, San Jose, all of Calif., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Aug. 29, 1986, Ser. No. 901,860

Int. Cl.[4] G06M *11/00*

U.S. Cl. 73—1 R **28 Claims**

1. A method for calibrating a flow cytometry instrument for using said instrument to obtain at least one light-related signal from particles passing through the instrument for analysis comprising:

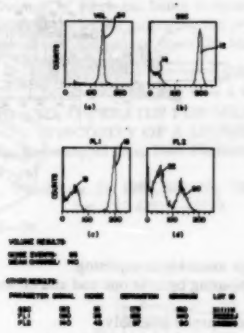
passing calibration particles, having characteristics of like nature to particles expected to be tested, in a liquid flow stream so that each calibration particle passes, substantially one at a time, through an incident beam of light;

detecting a light signal from the calibration particles passing through said beam of light;

detecting a noise signal from the calibration particles passing through said beam of light;

determining the ratio of the level of detected light signal to the level of detected noise signal;

reporting said ratio as a measured separation value between the light signal and the noise signal;



comparing said measured separation value to a predetermined separation value which represents a threshold for minimum instrument performance; and

adjusting, if the predetermined separation value has not been attained, the operation of the instrument, while the calibration particles are passing therethrough, until the measured separation value reaches said predetermined separation value whereby the instrument is calibrated for subsequently analyzing particles.

4,704,892

CONTROL SPECIMEN FOR EVALUATION OF NON-DESTRUCTIVE TEST RESULTS, ARTIFICIAL INCLUSIONS AND PROCESS FOR PRODUCING CONTROL SPECIMENS

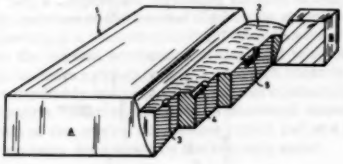
György Tarnai, Budapest, Hungary, assignor to Vasipari Kutato es Fejleszto Vallalat, Budapest, Hungary

Filed Jan. 7, 1986, Ser. No. 816,720

Claims priority, application Hungary, Jan. 7, 1985, 43/85

Int. Cl.[4] G01D *18/00;* **G01N** *33/20, 29/04*

U.S. Cl. 73—1 DV **18 Claims**



1. A control specimen for evaluation of non-destructive test results and for comparison of results measured on metal work pieces vs. the results measured on the control specimens, said control specimen consisting of a metal basic body and at least one artificial inclusion arranged in it, said inclusions are sintered non-metallic configuration, and are arranged according to the size and distribution conforming to the utilization of the work piece and to the purpose of the test, and wherein the composition of said at least one inclusion is as follows:

A_2O_3: min. 99%,

NaO: max. 0.5%,

Fe_2O_3: max. 0.4%,

SiO_2: max. 0.1%.

4,704,893

DEVICE FOR EQUILIBRATING A LIQUID REAGENT

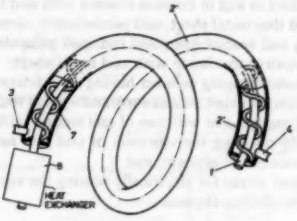
Hermann Marsoner, Steinberg; Gerald Kirchmayer, and Helmut List, both of Graz, all of Austria, assignors to AVL AG, Schaffhausen, Switzerland

Filed Sep. 3, 1986, Ser. No. 903,199

Claims priority, application Austria, Dec. 17, 1985, 3648/85

Int. Cl.[4] G01N *1/22*

U.S. Cl. 73—1 G **2 Claims**



1. A device for equilibrating small quantities of a liquid reagent with a gas-containing liquid or a gas, said device comprising

first tube means which extends helically in space, said first tube means providing an elongated gas chamber therein and including an inlet means for enabling said gas-containing liquid or gas to be supplied into said gas chamber and outlet means for enabling said gas-containing liquid or gas to be removed from said gas chamber,

a second tube means which extends into, continuously concentrically within, and out of said first tube means, said second tube means being used to convey said liquid reagent through said gas chamber, at least a portion of said second tube means which is located within said first tube means being permeable so that the partial pressures of said gas-containing liquid or gas in said gas chamber outside said second tube means will equilibrate with said liquid reagent inside said second tube means, and

a flexible coil located within said first tube means and helically wrapped around the second tube means to center said second tube means within said first tube means.

4,704,894

RESONATING KNOCK SENSOR

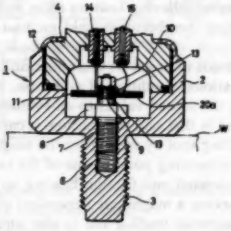
Shozin Inuzuka, and Shuji Yamashita, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Dec. 4, 1985, Ser. No. 804,451

Claims priority, application Japan, Dec. 5, 1984, 59-257122

Int. Cl.[4] G01L *23/22;* **G01H** *11/08*

U.S. Cl. 73—35 **6 Claims**



1. A resonating knock sensor for an engine, comprising:

a casing including means for mounting said casing on said engine;

a mounting rod fixed in said casing;

a thin metal sheet having first and second opposite planar surfaces attached at a central location to said mounting rod, said metal sheet surrounding said rod and spaced from said casing, said sheet being operative to vibrate upon vibration of the engine, casing and mounting rod in response to knocking of the engine;

an annular piezoelectric element having first and second opposite planar surfaces, said first surface integrally attached to and in intimate contact with said first surface of said thin metal sheet, said piezoelectric element surrounding and spaced from said rod, said piezoelectric element operative to vibrate with said metal sheet;

an elastic damping member having a predetermined configuration mounted on and surrounding said rod and in physical engagement with one of said second surfaces for elastically damping the vibration of said thin metal sheet and piezoelectric element; and

terminal means for electrically sensing the vibrations of said piezoelectric element.

4,704,895

METHOD AND DEVICE FOR MONITORING ROLLER DRILLING TOOLS

Rolf Böing, Hagen; Dietmar Frase, Dittelbrunn, and Manfred Noeske, Duisburg, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Fed. Rep. of Germany

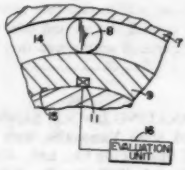
PCT No. PCT/EP85/00625, § 371 Date Aug. 6, 1986, § 102(e) Date Aug. 6, 1986, PCT Pub. No. WO86/03543, PCT Pub. Date Jun. 19, 1986

PCT Filed Nov. 16, 1985, Ser. No. 893,688

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1984, 3444846

Int. Cl.[4] G01L *5/00*; G01N *3/58*

U.S. Cl. 73—104 **3 Claims**



1. The method of monitoring the cutting or wart roller drilling tools of a drilling machine used in mining and tunnel construction, wherein said roller drilling tools are mounted on anti-friction bearings having bearing races and rolling bearing elements running therebetween, said method comprising the steps of:

sensing the loads imposed on said roller drilling tools as well as the rotational condition of said tools, and

transmitting the sensed values to an evaluation unit,

characterized in that said sensing step is carried out on each roller drilling tool by measuring the tangential loading at only one measuring point of one of the two bearing races of the associated anti-friction bearing so as to provide a voltage having a magnitude dependent on the magnitude of said tangential loading and to also simultaneously provide oscillation in such voltage magnitude caused by the rolling bearing elements of said anti-friction bearing moving past said measuring point.

4,704,896

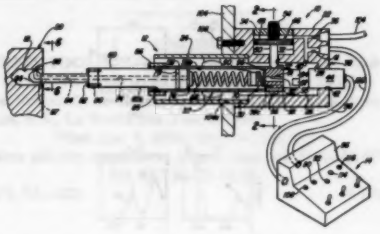
AIR GAGE ASSEMBLY

Norman H. Parsons, Bloomfield Hills, Mich., assignor to D-Tec, Inc., Fraser, Mich.

Filed Dec. 23, 1985, Ser. No. 812,065

Int. Cl.[4] G01B *13/00*

U.S. Cl. 73—37.9 **16 Claims**



1. An air gage assembly comprising:

A. a hollow housing open at one end and closed at the other end;

B. an elongated probe assembly;

C. means pivotally mounting said probe assembly to said housing at a location intermediate the ends of the probe assembly with one free end of the probe assembly positioned within the hollow of said housing and the other free positioned outside of said housing;

D. means for supplying air to said hollow of said housing; and

E. means for passing such air centrally through said probe assembly for discharge through said other free end of said probe assembly.

4,704,897

LOCATING METHOD OF AND THE LOCATING UNIT FOR LEAKS ON PIPING

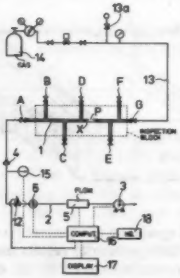
Akira Kawase, Tokyo, and Minoru Imamura, Yokohama, both of Japan, assignors to Tokyo Gas Co. Limited, Japan

Filed Sep. 24, 1986, Ser. No. 911,256

Claims priority, application Japan, Sep. 30, 1985, 60-217624; Sep. 30, 1985, 60-217625; Sep. 30, 1985, 60-217626

Int. Cl.[4] G01M *3/18*

U.S. Cl. 73—40.5 R **8 Claims**



1. A method for locating the position of a leak in a pipe, comprising, filling the pipe with an inert gas, sealing the pipe with inert gas therein, drawing gas from one end of pipe to reduce the pressure of gas in the pipe and to draw air into the pipe through a leak in the pipe to form an air layer in the pipe in the vicinity of the leak, opening an opposite end of the pipe, supplying inert gas into the opposite end of the pipe in a direc-

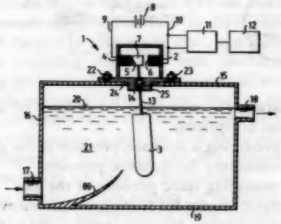
tion toward the first-mentioned end of the pipe for moving the air layer toward the one end of the pipe away from the leak, continuously measuring the air density of gas leaving the one end of the pipe using a sensor at a known location, measuring the volume of inert gas being supplied to the opposite end of the pipe, the pipe having a known sectional area, and calculating the distance between the leak and the known location of the sensor by dividing the volume by the sectional area of the pipe, the volume of inert gas being measured by noting the detection of air at the sensor indicating the presence of air layer at the sensor after it has moved from the leak.

4,704,898

METHOD AND APPARATUS FOR MEASURING THE VISCOSITY OF A LIQUID

Ernst Thone, Sorenkoppel 10 e, 2000 Hamburg 73, Fed. Rep. of Germany

Filed Aug. 21, 1985, Ser. No. 768,011
Int. Cl.[4] G01N *11/16*
U.S. Cl. 73—54 **6 Claims**



1. Apparatus for measuring the viscosity of a liquid comprising an oscillator for exciting the liquid to perform a multiplicity of oscillations, the damping of which executed in a comparative medium with the same oscillator is known, and wherein the oscillator is constructed as a paddle connected to an oscillation exciter; means for comparing the difference in the damping behavior of the oscillations appearing in the liquid with the damping behavior of the oscillation using the same oscillator in the comparative medium by determining the time required for a given damping of the oscillations of the oscillation exciter in the liquid; and means for computing the viscosity of the liquid from the time thus determined, in combination with an internal combustion engine into which fuel is injected and further including a fuel preheater which controls the temperature of the fuel; a temperature measuring element arranged immediately upstream of the internal combustion engine; said apparatus serving as a viscosity meter and being located at an interval from the internal combustion engine, and wherein the computer includes a closed control loop which controls the viscosity immediately upstream of the internal combustion engine as a function of the temperature as measured immediately upstream of the internal combustion engine and as a function of the viscosity determined by the viscosity meter.

4,704,899

MEASUREMENT OF PHYSICAL PROPERTIES OF THE SOLID COMPONENT OF A SLURRY

Kenneth J. Burr; Laurence S. Smith, and David Hazelden, all of St. Austell, United Kingdom, assignors to English Clays Lovering Pochin & Company, Limited, United Kingdom

Filed Jan. 16, 1985, Ser. No. 692,061
Claims priority, application United Kingdom, Jan. 17, 1984, 8401192
Int. Cl.[4] G01N *15/00*
U.S. Cl. 73—61 R **15 Claims**

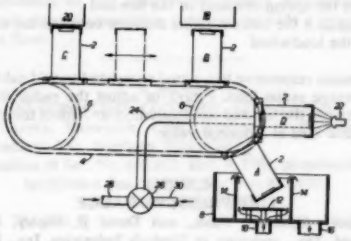
15. Apparatus for measuring a physical property of the solid component of a slurry, the apparatus comprising:

a container for the slurry;

a measuring station provided with a measuring unit;

a device for use in the preparation of a test sample of the solid component, the device comprising a chamber and a porous wall at least partly bounding the chamber, for supporting a filter element on the face of the element away from the chamber;

transport means for displacing the device from a sampling position, in which the porous wall is immersed in a slurry in the container, and a measuring position at the measuring station; and



a vacuum source and means for placing the vacuum source in communication with the chamber of the device to cause, in operation, when the device is in the sampling position, the liquid component of the slurry to pass through a filter element on the porous wall of the device leaving the solid component deposited on the filter element as a filter cake, said apparatus further comprising means for supplying washing liquid to the chamber in the device to provide back washing through the filter element; and

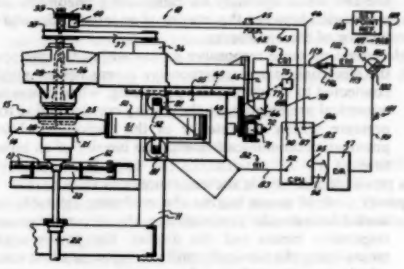
a flexible pipe connected to the connector means of the device, the flexible pipe being connectable selectively to the vacuum source and to a source of washing liquid.

4,704,900

APPARATUS AND METHOD FOR IMPOSING A DESIRED AVERAGE RADIAL FORCE ON A TIRE

James C. Beebe, Medina, Ohio, assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Aug. 19, 1986, Ser. No. 897,924
Int. Cl.[4] G01M *17/02*
U.S. Cl. 73—146 **8 Claims**



1. An apparatus for imposing a desired average radial force on a rotating tire, comprising:

(a) a loadwheel;

(b) means for urging said loadwheel and said tire into radial contact with one another;

(c) means for measuring both the radial force and the radial

distance between the tire and the loadwheel at a plurality of rotational positions of the tire;

(d) means for calculating an average radial force, F_{AVG} as the arithmetic average of said measured force values;

(e) means for calculating an average radial distance, D_{AVG} as the arithmetic average of said measured radial distance values;

(f) means for calculating the average radial load F_{CALC} on the tire according to the equation

$$F_{CALC}=F_{AVG}+k(d_{current}-D_{AVG})$$

where:

k is the spring constant of the tire and

$d_{current}$ is the current radial distance between the tire and the loadwheel

and

(g) means responsive to a signal correlated to said calculated average radial load, F_{CALC} to adjust the radial distance between the tire and said loadwheel to control the average radial load at a desired value.

4,704,901

TIRE PRESSURE GAUGE

Art Rocco, Spokane, Wash., and David R. Ripley, Flower Mound, Tex., assignors to Neotech Industries, Inc., Flower Mound, Tex.

Filed May 19, 1986, Ser. No. 864,799

Int. Cl.[4] G01L 9/00; G01M 17/02

U.S. Cl. 73—146.8 **10 Claims**

1. A tire pressure gauge, comprising:

a self-contained enclosure having a changeable numerical display visible at one exterior surface;

air inlet means mounted to the enclosure for sealing engagement against the outer end of the valve stem on an inflated tire and wheel assembly for establishing pneumatic communication between the interior of an inflated tire and the interior of the enclosure;

electronic pressure responsive means within the enclosure, the electronic pressure responsive means being operably connected to the display for producing, when powered, a numerical presentation on the display corresponding to air pressure within the interior of the enclosure while in pneumatic communication with the interior of an inflated tire;

a power source within the enclosure;

power control means within the enclosure operably connected between the power source, the electronic pressure responsive means and the display, the power control means being electronically shiftable between a first state in which operation of the electronic pressure responsive means and display are powered and a second state in which they are inoperative; and

switch means within the enclosure, operably connected to the power control means for selectively causing the power control means to be shifted to its first state when the switch means is actuated;

the electronic pressure responsive means being operable to cause the power control means to be shifted to its second state following a first predetermined time period after actuation of the switch means unless pneumatic communication is established between the interior of the enclosure and the interior of an inflated tire prior to expiration of the first predetermined time period.

4,704,902

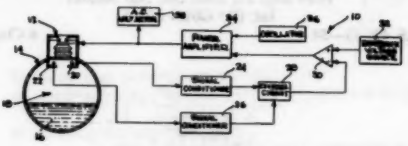
ACOUSTICAL VOLUME/PRESSURE MEASUREMENT DEVICE

Navin H. Doshi, 6418 Springpark Ave., Los Angeles, Calif. 90056

Continuation-in-part of Ser. No. 677,880, Dec. 4, 1984, Pat. No. 4,599,892. This application Jul. 10, 1986, Ser. No. 883,911

Int. Cl.[4] G01F 17/00

U.S. Cl. 73—149 **12 Claims**



1. An apparatus for measuring the volume of a gas in an enclosed space, comprising:

means for producing a dynamic pressure in the gas;

means for measuring the dynamic pressure;

means for measuring static pressure of the gas;

feedback control means for feeding measurements from said means for measuring dynamic pressure and said means for measuring static pressure to control said means for producing so that a ratio of the dynamic pressure to the static pressure is a selected constant.

4,704,903

LIGHT FASTNESS/WEATHER RESISTANCE ACCELERATED TEST MACHINE WITH AN AIR MIXING REGULATOR

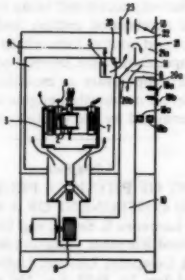
Shigeru Suga; Kiyoshi Chaki; Etsuji Natori; Shigeo Suga, and Katsuaki Mitamura, all of Shinjuku, Japan, assignors to Suga Test Instruments Co., Ltd., Tokyo, Japan

Filed May 19, 1986, Ser. No. 864,463

Claims priority, application Japan, Jun. 19, 1985, 60-133286

Int. Cl.[4] G01N 17/00, 25/00

U.S. Cl. 73—159 **6 Claims**



1. A light fastness/weather resistance accelerated test apparatus, comprising:

a test tank;

a light source provided at the center of said test tank;

a sample rotating frame in said test tank rotatable around said light source;

a black panel thermometer mounted on said sample rotating frame for sensing the temperature in said test tank at the position of a sample on said sample rotating frame;

an air flow regulator on said test tank and having a recirculation air intake opening therewith from said test tank and a tank discharge duct to which said recirculation air intake opens, an outside air intake and a discharge;

a blower mounted on said test tank for discharging air into the bottom of said tank;

a circulating duct connected between the discharge of said air flow regulator and said blower;

a first damper in said air flow regulator movable between a first position in which it opens said outside air intake to said discharge and opens the recirculation air intake to said tank discharge duct, and a second position in which it closes off said outside air intake and said tank discharge duct from said discharge and said recirculation air intake and directs air from said recirculation air intake into said discharge;

an air mixer having an intake duct with one end connected to said outside air intake of said air flow regulator and a second damper in said intake duct, and further having a bypass extending from said tank discharge duct and openng into said intake duct between said second damper and said outside air intake of said air flow regulator;

test tank air temperature regulating means having temperature sensing means in said test tank and connected to said first damper for controlling said first damper to move in response to the test tank air temperature;

a plurality of temperature sensors for detecting the air temperature outside said apparatus in the vicinity of the apparatus and a plurality of thermoregulators to which said temperature sensors are connected; and

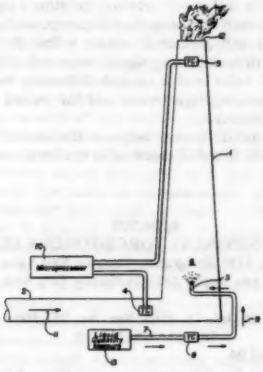
means connected to said second damper and to which said thermoregulators are connected for controlling the degree of opening of said second damper in response to the temperature outside said apparatus.

4,704,904

HIGH TEMPERATURE GAS FLOW METER

Robert T. McKie, Boise, Id., assignor to Morrison-Knudsen Company, Inc., Boise, Id.

Filed Dec. 10, 1985, Ser. No. 807,296
Int. Cl.[4] G01F *1/68*
U.S. Cl. 73—204 **10 Claims**



1. Apparatus for measuring the quantity of a flowing gas at high temperature comprising:

a gas flow conduit including a smoke stack for discharge of hot gas into the atmoshpere;

liquid injection means located within the conduit for injection of liquid into the flowing gas;

liquid conduit means operatively associated with the liquid injection means and extending from a source of liquid to the liquid injection means;

temperature sensing means for measuring gas temperature positioned within said conduit, downstream from said liquid injection means;

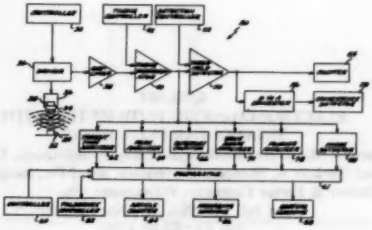
liquid quantity measuring means for measuring a liquid quantity that is injected into said conduit; and means responsive to said temperature sensing means and said liquid quantity measuring means to provide a measure of gas flow.

4,704,905

AUTOMATION CONTROL APPARATUS

Arvind Arora, Moorpark, Calif., assignor to Photoacoustic Technology, Inc., Newbury Park, Calif.

Continuation of Ser. No. 658,622, Oct. 9, 1984, abandoned. This application Jun. 9, 1986, Ser. No. 873,470
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—596 **14 Claims**



1. An automation control apparatus for determining whether an object is within a target area, and, if so, for determining whether the object meets predetermined acceptability criteria to be classified as a desired article, comprising:

means for emitting a beam of acoustic energy toward the target area;

means for receiving a signal back from the target area;

means for amplifying the signal received back from the target area;

means for determining whether the amplified signal has an amplitude greater than a predetermined value;

waveform analysis means for analyzing the amplified signal to determine its waveform characteristics, and for comparing the waveform characteristics with the predetermined acceptability criteria; and

means for signalling the presence and acceptability of the article.

4,704,906

DYNAMIC AIR GAP MEASURING DEVICE FOR USE WITH ROTATING ELECTRICAL MACHINERY

Thomas L. Churchill, North Bend, and James M. Ross, Bothell, both of Wash., assignors to Electric Power Research Institute, Palo Alto, Calif.

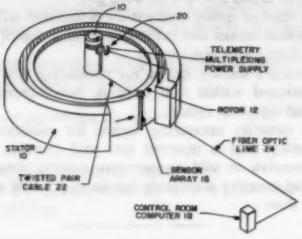
Filed Apr. 10, 1986, Ser. No. 850,234
Int. Cl.[4] G01N *29/00*
U.S. Cl. 73—660 **10 Claims**

8. A method of measuring air gap between a rotor and a stator in rotating electrical machinery comprising the steps of

mounting signal transmitter and receiver means on one of said rotor and stator,

transmitting signals to the other of said rotor and stator and receiving reflected signals therefrom,

determining the time between signal transmission and reflected signal reception, and



determining from said time the air gap between said rotor and said stator.

4,704,907

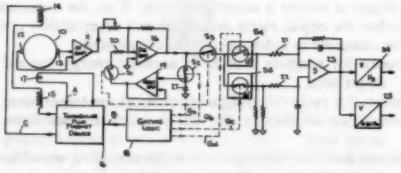
ELECTROMAGNETIC FLOWMETER WITH TRIANGULAR FLUX DRIVE

Elmer D. Mannherz, Southampton; Roy F. Schmoock, Yardley, and Herbert A. Shauger, Doylestown, all of Pa., assignors to Fischer & Porter Company, Warminster, Pa.

Filed Jul. 11, 1986, Ser. No. 884,510

Int. Cl.[4] G01F *1/60*

U.S. Cl. 73—861.17 **8 Claims**



1. An electromagnetic flowmeter provided with a flow tube having a pair of electrodes mounted thereon at opposed positions and an electromagnet to establish a transverse magnetic flux field in the tube, whereby when the flux field is intersected by the flowing fluid, a voltage is induced therein which is transferred to the electrodes to produce a flow signal, said flowmeter comprising:

A. means to so drive said electromagnet as to produce a flux field having a triangular waveform the flow signal yielded at the electrodes is a composite wave having a triangular wave component that is a function of the triangular flux wave and the flow and a rectangular wave component that is a function of the derivative of the magnetic flux in respect to time which by reason of the triangular flux wave is a constant independent of flow; and

B. a converter responsive to said flow signal and including means to cancel said rectangular wave component whereby the signal output of said converter is proportional to the flow rate of the fluid, said means to cancel including means in said converter to force the composite wave to zero immediately following flux reversal.

4,704,908

METHOD FOR COMPENSATING INTERFERENCE VOLTAGES IN THE ELECTRODE CIRCUIT IN MAGNETIC-INDUCTIVE FLOW MEASUREMENT

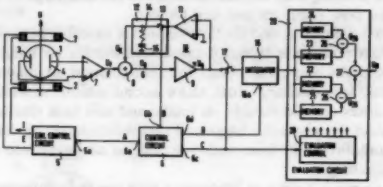
Max Blatter, Münchenstein, Switzerland, assignor to Flowtec AG, Switzerland

Filed Oct. 20, 1986, Ser. No. 921,230

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1985, 3537752

Int. Cl.[4] G01F *1/58*

U.S. Cl. 73—861.17 **5 Claims**



1. Method for compensating interference voltages in the electrode circuit in magnetic-inductive flow measurement with periodically reverse-poled DC magnetic field in which the magnetic field in successive half periods assumes alternately oppositely poled values and the useful signal is obtained in that the signal voltage in each half period is sampled during a measuring signal sampling interval and the difference is formed between in each case two signal values obtained in oppositely poled values of the magnetic field, and in which in a compensation interval following each measuring signal sampling interval within the same half period by sampling and storing the signal voltage a compensation voltage oppositely superimposed on the signal voltage is generated which compensates the signal voltage to the value zero within the compensation interval and is retained until the next compensation interval, said method comprising the following steps:

(a) storing a first measuring signal value and a second measuring signal value obtained by sampling the signal voltage in a measuring signal sampling interval in each half period;

(b) sampling the signal voltage during a correction sampling interval following each compensation interval in each half period to form a first correction signal value and a second correction signal value;

(c) storing the first correction signal value and the second correction signal value;

(d) forming the difference between the stored signal values obtained in each case between two compensation intervals in different half periods to obtain a first difference between the first measuring signal value and a first correction signal value and a second difference between the second measuring signal value and the second correction signal value; and

(e) forming the difference between the second difference value and the first difference value to obtain a useful signal value.

4,704,909

MULTICOMPONENT FORCE-TORQUE SENSOR

Allen R. Grahn, 3735 Emigration Canyon, Salt Lake City, Utah 84108, and Lynn Astle, 4291 Holloway Dr., Salt Lake City, Utah 84124

Filed Jul. 22, 1985, Ser. No. 757,360

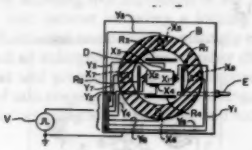
Int. Cl.[4] G01L *5/16*

U.S. Cl. 73—862.04 **28 Claims**

18. A process for determining a plurality of force-torque components comprising:

(a) subjecting a loadable means to a plurality of force-torque components;

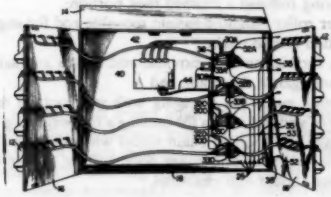
(b) transmitting signals from a signal-transmission means;
(c) reflecting said transmitted signals with a signal-reflection means;
(d) detecting said reflected signals with a signal-detection means; and



(e) determining the transit times of said signals to determine a plurality of force-torque components;
wherein the signal transit times are altered in response to the force-torque components to which said loadable means is subjected.

4,704,910
METHOD AND APPARATUS FOR AUTOMATIC SAMPLING OF GASES

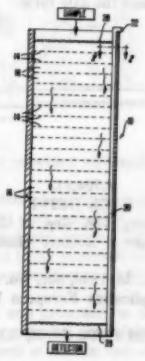
Rodney W. Conrad, Denver, Colo., assignor to Romed Corporation, Denver, Colo.
Filed Nov. 2, 1984, Ser. No. 667,767
Int. Cl.[4] G01N *1/24*
U.S. Cl. 73—863.21 **12 Claims**



1. Gas washing apparatus for sequentially selecting samples of gas from a common source of gas over a predetermined time interval comprising:
a plurality of sample containers, an outer housing including at least one display shelf, and support means operative to support said sample containers in a row on said display shelf;
a vacuum source including a gas evacuation line from said vacuum source to each of said sample containers, and a gas supply line extending from said source of gas to each of said sample containers;
menas for connecting said gas supply lines and gas evacuation lines to each of said sample containers;
valve control means normally closing said gas supply and gas evacuation lines to each said sample container including activating means associated with said valve control means and operative to simultaneously open said gas supply line and gas evacuation line to each said sample container in succession whereby to evacuate each said sample container in succession in order to draw gas via said open gas supply line into said sample container from said source of gas, said activating means responsive to a control signal to retain said valve control means for each said sample container in the open position over a predetermined time interval;
control circuit means for transmitting said control signals sequentially ot said activating means at predetermined timed intervals whereby to sequentially open said valve control means for each said sample container while said valve control means for all other said sample containers are in a closed position; and
a control panel associated with said housing, said valve control means on said control panel, and said gas evacuation and gas supply lines extending from said source of gas through said display shelf for connection to said containers.

4,704,911
APPARATUS FOR ANALYSIS OF PARTICULATE MATERIAL

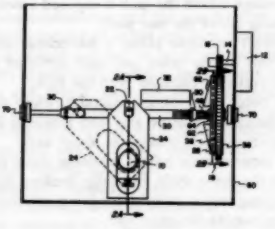
Thomas P. Meloy, 5124 Baltan Rd., Bethesda, Md. 20816
Filed May 8, 1986, Ser. No. 860,784
Int. Cl.[4] G01N *15/02*
U.S. Cl. 73—865.5 **10 Claims**



1. Apparatus for analysis of particulate material comprising a tubular housing providing therein a flow path for the particulate material between opposite ends of the housing, a stack of spaced sieves in said housing dividing said flow path into a series of inter-sieve spaces that, in use, are isolated from the exterior of said housing except for said flow path, and normally closed clean-out port means for removing there-through particulate material accumulated in said inter-sieve spaces along paths different from said flow path.

4,704,912
SLIDING CRANK ACTUATOR

Peter Payne, Wheeling, Ill., assignor to Honeywell Inc., Minneapolis, Minn.
Filed May 13, 1986, Ser. No. 862,732
Int. Cl.[4] F16H *29/02, 1/18;* F16K *31/50*
U.S. Cl. 74—89.15 **2 Claims**



1. A sliding crank actuator for rotating an axle connectable to the actuator, the axle being provided as part of a system external to the actuator, the axle being rotatable in the external system about an axis which is located at a fixed distance from

and which is perpendicular to a drive screw in the actuator, the sliding crank actuator comprising:

a drive screw rotatable about a fixed axis;

a drive nut on the drive screw, the drive nut moving along the length of the drive screw as the drive screw is rotated; and

a crank arm having a first member and a second member slideably interconnected so that the first and second members slide longitudinally with respect to each other, the first member being pivotally connected to the drive nut so that the crank arm can pivot about the drive nut, the second member comprising means for connecting the second member to the axle so that, as the drive nut moves along the drive screw, the axle connected to the second member is rotated, the first member of the crank arm sliding along the second member of the crank arm as the drive nut moves and the axle turns.

4,704,913

RACK DRIVE

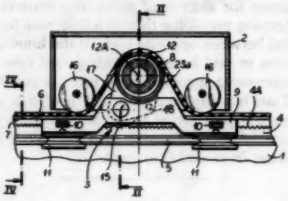
Ernst Zimmer, Friedberg, Fed. Rep. of Germany, assignor to Kuka Schweissanlagen + Roboter GmbH, Augsburg, Fed. Rep. of Germany

Filed Mar. 26, 1986, Ser. No. 844,464

Claims priority, application European Pat. Off., Mar. 26, 1985, 85103597

Int. Cl.⁴ F16H *19/04, 35/08;* B23Q *11/08*

U.S. Cl. 74—89.17 **18 Claims**



1. A rack-type drive for displacing a movable part longitudinally and horizontally relative to a stationary part, the drive comprising:

a longitudinally extending rack fixed on one of the parts, the one part being formed above the rack with a longitudinal slot through which the rack is exposed upward, the other part being above the one part;

a drive shaft rotatable about a horizontal and transverse upper axis on the other part and provided with a drive gear operatively engaged with the rack;

a pair of outer idler rollers generally below and longitudinally flanking the drive gear and rotatable about respective horizontal and transverse lower axes;

a pair of inner central rollers rotatable about the transverse axis on the drive shaft, coaxially flanking the drive gear, and having outer peripheries lying relative to the axis radially outside the gear; and

a belt extending along and covering the slot to both longitudinal sides of the other part, passing under the outer idler rollers, and passing over the inner central rollers in engagement with the peripheries thereof but out of contact with the drive gear.

4,704,914

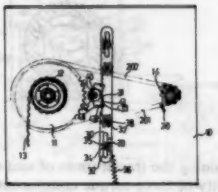
CHAIN BREAKDOWN SAFETY DEVICE FOR A POWER-DRIVEN ROLLER DOOR

Jin-Shan Horng, No. 579-39, Aur Feng Road, Ching Shui Chen, Taichung Hsien, Taiwan

Filed Mar. 17, 1986, Ser. No. 839,968

Int. Cl.⁴ F16H *57/10*

U.S. Cl. 74—411.5 **3 Claims**



1. A safety device for a cable operated power driven roller door of the type having a motor, a sprocket attached to the motor, a chain mounted on the sprocket and a toothed chain wheel driven by the chain for winding or unwinding a cable to which the roller door is attached, comprising:

a steering rod disposed on both sides of said chain between said sprocket and chain wheel;

an elongate movable rod disposed substantially perpendicular to a line extending between the centers of said sprocket and said chain wheel, respectively, said movable rod having a pair of slots formed therein for receiving said steering rod and a toothed rack portion;

an idler roller mounted to said movable rod for engaging a portion of said chain;

means for biasing said movable rod means and said roller means against the chain; and

ratcheting means for engaging with said toothed rack portion of said rod means for causing a first engaging tooth to engage said toothed chain wheel when said movable rod shifts, whereby said roller door will be prevented from falling should said chain fail.

4,704,915

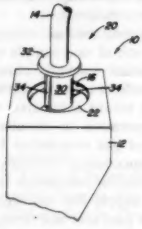
VALVE CONTROL LOCKOUT

Henry Friesen, Niagara Falls, and Antonius H. G. van Hooydonk, St. Catharines, both of Canada, assignors to Deere & Company, Moline, Ill.

Filed Feb. 25, 1986, Ser. No. 834,007

Int. Cl.⁴ G05G *9/16*

U.S. Cl. 74—471 XY **9 Claims**



1. In a bucket loader having a single-lever boom and bucket control including a cover enclosing said control and having an opening formed therein, and a control lever selectively movable in both fore-and-aft and side-to-side directions, said lever being operably connected to said control and extending up-

wardly therefrom and disposed to extend through said opening, the improvement comprising:

a lockout slidably attached to said lever above said control and movable within said opening between a locked position wherein said lockout engages said cover, and a free position wherein said lockout is spaced from said cover, thereby allowing free movement of the lever in all directions, said lockout including a locking flange having a peripheral edge conformed to matingly engage said opening and an enlarged shoulder member disposed to extend beyond said peripheral edge and disposed to engage one side of said cover adjacent said opening; and

means for retaining said lockout in said locked position.

4,704,916

SELECTOR SHAFT RETURN GUIDE FOR A MULTIPLE SPEED TRANSMISSION

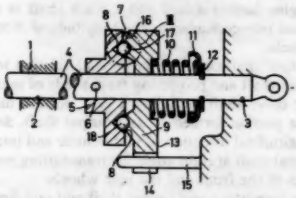
Egon Wilhelmy, Bad Honnef, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 18, 1986, Ser. No. 908,834

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1986, 3603609

Int. Cl.⁴ G05G *5/06*

U.S. Cl. 74—475 **6 Claims**



1. A selector shaft return guide for a multiple speed ratio transmission having multiple gear shift planes comprising:

selector shaft means mounted for rotation about its longitudinal axis for selecting the gear shift planes;

a lever member rotationally fixed to the selector shaft means, defining a track directed angularly about the axis of the selector shaft means having a track surface inclined with respect to said axis;

a holding member displaceable axially relative to the selector shaft means, defining a ball socket angularly and radially aligned with the lever member track;

ball means located in the ball socket for movement in the lever member track; and

spring means for urging the holding member socket toward the lever member track, whereby the ball means is retained between said socket and said track.

4,704,917

TRANSFER SYSTEM FOR VEHICLES

Fujikawa Hiroyasu, Hiroshima, Japan, assignor to Kanda Tekko Kabushiki Kaisha, Hiroshima, Japan

Filed Nov. 21, 1985, Ser. No. 800,456

Claims priority, application Japan, Dec. 28, 1984, 59-277727; Jun. 7, 1985, 60-86730[U]

Int. Cl.⁴ B60K *20/02*

U.S. Cl. 74—475 **4 Claims**

1. A transfer system for vehicles comprising:

a casing for a transfer system which is connected to an output side of a transmission of a four wheel drive vehicle;

a shift cam shaft rotatably held by said casing;

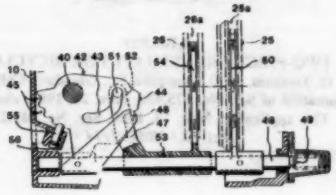
a plate form shift cam mounted on an inside end of said shift cam shaft, said plate form shift cam being provided with an outer circumferential uneven portion and a cam hole or a cam groove formed through the cam plate;

a first cam pin which press-fits to said outer circumferential uneven portion;

a second cam pin which fits in said cam hole of said cam groove;

a first shift sleeve and a second shift sleeve disposed on an input shaft and a rear wheel output shaft which are coaxial to each other; and

a first shift fork and a second shift fork which move said first shift sleeve and the second shift sleeve along the shaft center by way of coupling members which are linked mechanically with said first cam pin and second cam pin, said coupling members comprising:



a first cam arm provided with said first cam pin at the top end;

a shift rod slidably held by said casing such that the rod slides parallel with said input shaft and rear wheel output shaft which are disposed integrally with each other, said shift rod being provided with the base of said first cam arm at one end and said first shift fork at the other end; and

a second cam arm provided on one end of a cylindrical base slidably mounted on said shift rod, said second cam pin bring fixed at the top end of said second cam arm, said cylindrical base being provided with a second shift fork at the other end.

4,704,918

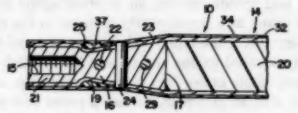
COMPOSITE MATERIAL FORCE OR MOTION TRANSMITTING MEMBER

Stanley S. Orkin, Vernon, and Craig L. Carlson, Granby, both of Conn., assignors to Kamatics Corporation, Bloomfield, Conn.

Filed Feb. 19, 1985, Ser. No. 702,420

Int. Cl.⁴ F16C *3/00*

U.S. Cl. 74—579. R **6 Claims**



1. In a force-transmitting rod the combination comprising:

an end fitting having an outer end face defining the associated end of said rod and an inner end face spaced axially inwardly of said outer end face and defining the inner limit of said end fitting, said end fitting further including a tapered portion extending from said inner end face such that the diameter of said end fitting diminishes in proceeding from said inner end face toward said outer end face along said tapered portion,

a stiff, generally tubular strength member having a main portion extending along a substantial portion of its length and of substantially constant outside diameter, said strength member also having an end portion adjacent said main portion which end portion surrounds a part of said end fitting including said tapered portion, said end portion of said tubular member having throughout its length a diameter less than said outside diameter of said main por-

tion of said tubular member, said tubular member including a layer of braided strands embedded in a cured resin, and

at least one discrete protuberance extending from the surface of said tapered portion of said end fitting and passing at least partially through the thickness of said braided layer to anchor said strength member to said end fitting,

said end portion of said tubular strength member also including a layer of strands wrapped generally circularly around said braided layer along at least a part of the length of said tapered portion of said end fitting, said layer of circularly wrapped strands being also embedded in said cured resin.

4,704,919

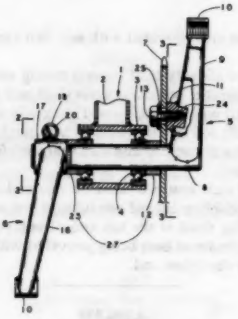
TWO-PIECE CRANKSHAFT FOR BICYCLES

Roger O. Durham, 1370 Thompson St., Glendale, Calif. 91201

Continuation of Ser. No. 675,956, Nov. 28, 1984, abandoned. This application Mar. 18, 1986, Ser. No. 841,273

Int. Cl.[4] G05G *1/14*

U.S. Cl. 74—594.1 **4 Claims**



1. In a bicycle having a crank tube with ball bearings mounted in opposite bores of said bicycle crank tube, said ball bearings having normally inseparable inner races and outer races, a two-piece bicycle crankshaft including:

(a) a spindlearm means comprising: a cylindrical spindle for sliding engagement with the inner races of said ball bearings, said spindle having an external spline at one end; a fixed crank arm permanently secured to the other end of said spindle; and an internally-threaded pedal boss permanently secured to one end of said fixed crank arm;

(b) a removable crank arm means comprising: a removable crank arm; an internally-threaded pedal boss permanently secured to one end of said removable crank arm; an internally-splined boss secured to the other end of said removable crank arm, said internally-splined boss for engagement with said external spline of said spindle, said internally-splined boss having a longitudinal slot extending from a bore of said internally splined boss to an outer surface of said internally splined boss; a pair of pinch bolt bosses permanently secured to said internally-splined boss on opposite sides of said longitudinal slot, said pinch bolt bosses being axially aligned with each other;

(c) Tubular spacer means for positioning said spindlearm means and said removable crank arm means away from said bearing inner races;

(d) pinch bolt means for insertion through said pinch bolt bosses, and for securing said removable crank arm to said spindle;

(e) sprocket mounting means for mounting a bicycle drive sprocket to one of said crank arms.

4,704,920

POWER TRANSMISSION DEVICE OF FOUR WHEEL DRIVE VEHICLE

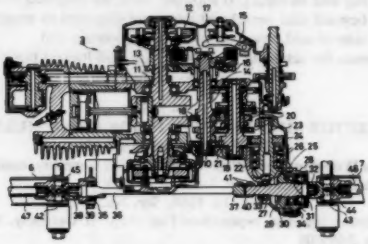
Noboru Kurata, Kamifukuoka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1986, Ser. No. 854,353

Claims priority, application Japan, Apr. 19, 1985, 60-84284

Int. Cl.[4] F16H *37/06*

U.S. Cl. 74—665 GC **2 Claims**



1. A power transmission device of a four wheel drive vehicle comprising:

an engine having a case and a crank shaft in said case disposed perpendicular to the longitudinal direction of said vehicle;

an output shaft disposed in parallel relation to said engine crank shaft and projecting from a side of said engine case;

a first drive shaft including a gear portion meshed with a gear portion formed on said output shaft, disposed in the longitudinal direction of said vehicle and intersecting said output shaft at right angle for transmitting power to either ones of the front and the rear wheels;

a case supporting said output shaft and said first drive shaft, and detachably attached to an internal combustion engine; and

a second drive shaft outside of said case supporting said output shaft and said first drive shaft, said second drive shaft being supported on an extension of said first drive shaft and connected to said first drive shaft for transmitting power to the remaining wheels of the front and the rear wheels.

4,704,921

DIFFERENTIAL GEAR DRIVE HAVING TWO OUTPUT SHAFTS BETWEEN WHICH THERE IS A LIMITED SPEED RATIO

Timothy S. Fry, Rugby, United Kingdom, assignor to Bartel Engineering Limited, Harleston, United Kingdom

Filed Apr. 9, 1986, Ser. No. 849,783

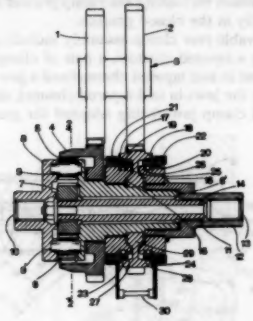
Claims priority, application United Kingdom, Apr. 9, 1985, 8509056

Int. Cl.[4] F16H *1/42, 1/44*

U.S. Cl. 74—714 **8 Claims**

1. A limited ratio differential gear drive comprising a differential gear assembly comprising an input annular gear; a sun gear; a plurality of planet gears intermeshed between said annular gear and said sun gear; a rotatable planet carrier; a first rotatable output member driven by said sun gear; a second rotatable output member driven by said planet carrier, said annular gear, said sun gear, said planet carrier and said first and said second output members all being co-axial and having a common first axis of rotation; said gear drive also comprising a driven reference gear rotatable independently about said first axis; a countershaft rotatable about a second axis parallel to said first axis; an input driving gear and an input reference gear both mounted for rotation as a unit with said countershaft, said input driving gear drivingly engaging said annular gear of said differential gear assembly and said input reference gear drivingly engaging said driven reference gear, the respective gear

ratios between said input driving gear and said annular gear and between said input reference gear and said driven reference gear being in a predetermined ratio one to the other, whereby said annular gear is driven slower than said driven reference gear in said predetermined ratio; first and second annular clutch faces on said driven reference gear; first and second cam rings non-rotatably and co-axially mounted on said first and second output members respectively, each cam ring having a plurality of cam surfaces thereon; first and second clutch rings rotatable and co-axially mounted with respect to each of said cam rings, each said clutch ring having a plurality of teeth and an annular clutch face thereon, said teeth being engaged with said cam surfaces on the respective cam ring and said clutch face on each clutch ring being engageable with a respective one of said clutch faces on said driven reference



gear, and first and second fixed bearing means in which the respective first and second clutch rings are mounted, whereby on rotation of the respective first and second output members below the speed at which said driven reference gear is rotating, said clutch face on the respective clutch ring is spaced from the respective clutch face on said driven reference gear and thereby the respective speeds of said first and second output members are determined solely by said differential gear assembly and when one of said first and second output members attains the speed of rotation of said driven reference gear, said one output member is constrained from exceeding that speed by the clutch face of the respective clutch ring engaging the respective clutch face of said driven reference gear as a result of said clutch ring being driven by said cam surfaces of the respective cam ring in opposition to drag exerted by the respective fixed bearing means.

4,704,922

CONTROL APPARATUS FOR USE IN A POWER TRANSMISSION SYSTEM OF CONSTRUCTION VEHICLES

Toshitaka Suketomo, Kawasaki, and Kenjiro Nezuka, Sayama, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

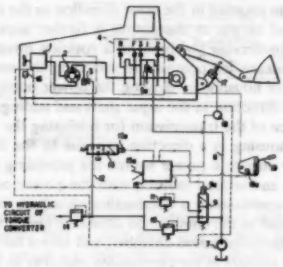
Filed Oct. 30, 1986, Ser. No. 925,359

Claims priority, application Japan, Oct. 31, 1985, 60-242793

Int. Cl.[4] B60K *41/18*; F16H *47/00*

U.S. Cl. 74—733 **4 Claims**

1. A control apparatus for use in a power transmission system of construction vehicles, comprising at least one work implement adapted to be actuated by a hydraulically driven actuator means, a transmission gear adapted to be actuated by a speed-change clutch means, and a torque converter interposed between an engine and said transmission gear so as to transmit the power for rotation generated by the engine to the transmission and having a stator clutch, characterized in that the control apparatus comprises a hydraulic fluid supply source; a first and a second solenoid actuated clutch pressure change-over valves connected with two hydraulic circuits which connect the hydraulic fluid supply source with the speed-change clutch means and said stator clutch, respectively, said first and second clutch pressure change-over valves being adapted to change the fluid pressure in said hydraulic circuits over to a high value and a low value; an engine rotation sensor connected on the output side thereof with respective solenoids of the first and second clutch pressure change-over valves, respectively, and adapted to detect the rotational speed of the



engine; a pressure sensor adapted to detect the fluid pressure in the hydraulically driven actuator means; a speed-change lever position sensor adapted to detect the shift of the speed-change lever to its first speed position; and a controller connected on the input side thereof with said engine rotation sensor, said pressure sensor and said speed-change lever position sensor, wherein said first and second clutch pressure change-over valves are controlled in response to the input signal from their respective sensors.

4,704,923

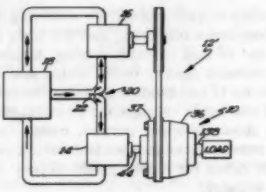
POWER TRAIN HAVING AN INFINITELY VARIABLE TRANSMISSION

Paul R. Taylor, P.O. Box 101, Pelican Lake, Wis. 54463

Continuation-in-part of Ser. No. 517,015, Jul. 25, 1983, Pat. No. 4,662,245. This application May 24, 1985, Ser. No. 737,541

Int. Cl.[4] F16H *3/44*

U.S. Cl. 74—785 **18 Claims**



7. Infinitely variable transmission having no external controls comprising, in combination: a rotatable input; a rotatable output, with the input and output lying along and being dynamically balanced along a transmission axis; a power housing having an interior; means for rotatably mounting the power housing on the input about the transmission axis; means for rotatably mounting the power housing on the output about the transmission axis, with the power housing being dynamically balanced along the transmission axis; a drive gear located in the interior of the power housing and operatively attached to the input along the transmission axis; at least a first, planetary gear located in the interior of the power housing and operatively attached to the output along a planetary gear axis which is parallel to but spaced from the transmission axis, with the planetary gear being in gearing relation with the drive gear; a ring gear located in the interior of and operatively attached to the power housing along the transmission axis, with the ring

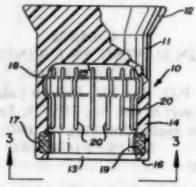
gear being in gearing relation with the planetary gear; a lubricant having a viscosity located in the interior of the power housing, with the transmission having an internal resistance created by the drag and friction of the drive, planetary, and ring gears gearing together and the viscosity of the lubricant for influencing the rotation and acceleration of the output, wherein if the load is sufficient, the power housing will rotate in a direction opposite to the direction of the input and output when the output is initially accelerated and will cease rotation and begin rotating in the same direction as the direction of the input and output as the output is further accelerated; a first motor for driving the input in a rotation direction; a second motor; means for operatively attaching the second motor to the power housing for driving the power housing in the same rotation direction as the input shaft and adding to the internal resistance of the transmission for inhibiting the rotation of the power housing in a direction opposite to the direction of the input or output; a power source for providing power flow to the first and second motors; with the power cource comprising, in combination: a combustion chamber; means for introducing fuel to the combustion chamber, means for introducing air into the combustion chamber, and means for igniting the air and fuel mixture in the combustion chamber to produce a flow of pressurized gases, with the flow of pressurized gases being provided to the first and second motors.

4,704,924

SAFETY STOPPER ENGAGER

Ronald Echols, 3188 Aris Dr., Warren, Ohio 44483

Filed Mar. 24, 1986, Ser. No. 843,243
Int. Cl.[4] B67B *7/02*
U.S. Cl. 81—3.4 **5 Claims**



1. A safety stopper engager for removing stoppers from test tubes comprises a resilient cylindrical body member, a cavity in one end of said cylindrical body member, a plurality of spaced recessed annular bands within said cavity, absorbent means in one of said bands extending outwardly therefrom, the other of said bands for engaging an increased diameter of said stopper about its upper portion, means for stabilizing said stopper remover in an independent fashion away from said test tube and means for retaining said stopper within said safety stopper engager.

4,704,925

PNEUMATIC CABLE STRIPPER

Donald C. Sutton, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 27, 1986, Ser. No. 885,479
Int. Cl.[4] H02G *1/12*
U.S. Cl. 81—9.4 **11 Claims**

1. Apparatus for stripping insulation from electrical cables comprising:

(a) a housing box, said housing box having a partially open end at the rear;

(b) a rotary drive means;

(c) a spool coupled to said rotary drive means, said spool being disposed in said housing box and being driven by said rotary drive means;

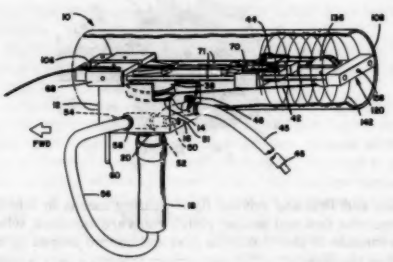
(d) a takeup rope having one end coupled to said spool for takeup upon actuation of said rotary drive means;

(e) means for actuating said rotary drive means;

(f) a fixed front clamp assembly mounted on said housing box, said front clamp assembly including a guide block having a tapered channel, a pair of clamp jaws movably disposed in said tapered channel and a jaw guide for maintaining the jaws in the tapered channel, said guide block being fixed to said housing box, the inside surface of said clamp jaws being adapted for grasping said wire when said clamp jaws are forced together, the outside surface of said clamp jaws being tapered so that rearward movement of said clamp jaws in said tapered channel will force said jaws together toward a closed position, said front clamp assembly being mounted on said housing with said tapered channel directed toward the rear of the housing box;

(g) first means for biasing the clamp jaws of said front clamp assembly in the closed position;

(h) a movable rear clamp assembly including a guide block having a tapered channel, a pair of clamp jaws movably disposed in said tapered channel and a jaw guide for maintaining the jaws in said tapered channel, the inside surface of said clamp jaws being adapted for grasping said wire



when said clamp jaws are forced together, the outside surface of said clamp jaws being tapered so that forward movement of said clamp jaws in said tapered channel will force said jaws together toward a closed position, said rear clamp assembly being disposed so that said tapered channel is directed toward the front of the housing box;

(i) second means for biasing the clamp jaws of said rear clamp assembly in the closed position;

(j) a rear block pulley assembly disposed to the rear of said rear movable clamp assembly, said rear block pulley assembly including a pulley and means for mounting said pulley, the takeup rope being fed from said spool over said pulley and coupled to the guide block of said rear clamp assembly;

(k) means for supporting said rear clamp assembly and said rear block pulley assembly; and

(l) third means for biasing the rear movable clamp assembly against said front clamp assembly so that the clamp jaws of the front clamp assembly and the clamp jaws of the rear clamp assembly abut, said third means for biasing overcoming said first and second means for biasing so that said clamp jaws of said front and rear clamp assemblies are forced into an open position.

4,704,926

TURRET FOR AN AUTOMATIC LATHE

Pier C. Boffelli, Milan, Italy, assignor to Baruffaldi Frizioni S.p.A., Milan, Italy

Filed Sep. 2, 1986, Ser. No. 902,482
Claims priority, application Italy, Sep. 11, 1985, 22979/85[U]
Int. Cl.[4] B23B *29/32*
U.S. Cl. 82—36 A **14 Claims**

1. A turret for an automatic lathe, comprising:

a fixed member;

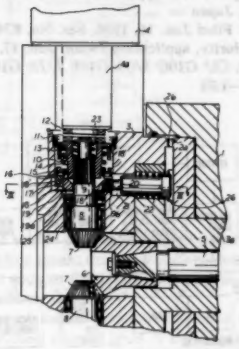
a rotatable tool-carrying body mounted on said fixed member for rotation about a turret axis, said body being formed with a plurality of locations angularly spaced about said axis at which respective tools can be mounted on said body, at least some of said tools being rotatable about respective tool axes lying radially of said turret axis;

a drive shaft extending along said turret axis into said body;

respective driven shafts extending along said tool axes perpendicular to said drive shaft and journaled in said body;

gearing in said body coupling each of said driven shafts with said drive shaft for common rotation of all said driven shafts by said drive shaft;

a respective coupling element rotatably entrained by each of said driven shafts and axially shiftable relatively thereto along a respective tool axis between a disengaged position wherein said element is decoupled from a respective tool



and can rotate freely independently of the respective tool and an engaged position wherein said coupling element is engaged with the respective tool to drive the same;

a respective plunger for each of said driven shafts displaceable in said body in a direction parallel to said turret axis;

means coupling each plunger with the respective coupling element for shifting each coupling element between said disengaged position and said engaged position; and

means on said fixed member cooperating with the respective plunger when said body is rotated about said turret axis to bring the respective tool into a working position of the lathe to shift the respective coupling element into its engaged position and thereby drive the tool in said working position whereas all of the other tools remain undriven because the respective coupling elements are in the respective disengaged position.

4,704,927

CUTTING REPRODUCTION IMAGES OUT OF A SHEET OF EXPOSED FILM

Makoto Hirosawa, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Jun. 19, 1985, Ser. No. 746,622

Claims priority, application Japan, Aug. 3, 1984, 59-164105

Int. Cl.⁴ B26D *5/30;* **G05B** *19/18*

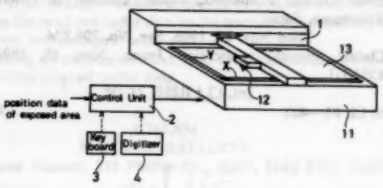
U.S. Cl. 83—13 **5 Claims**

1. Method of cutting each of a number of reproduction images corresponding to at least on original from a sheet of photosensitive film on which they are recorded in at least one exposed area, said reproduction images each having at least one color separation image recorded on said film, comprising the steps of:

(a) scanning the exposed are of the at least one original and storing in a memory position data defining exposed areas each containing at least one color separation image of the original, and inputting border data defining a border size around each said at least one color separation image;

(b) positioning the sheet of photosensitive film on a cutting device;

(c) using the cutting device for cutting a piece which contains one exposed area from said photosensitive film sheet in accordance with said position data and said border data;



(d) using the cutting device for cutting apart said piece of photosensitive film at said each said at least one color separation image according to the color thereof obtained during scanning;

(e) repeating steps (c) and (d) for each exposed area of the photosensitive film sheet.

4,704,928

DEVICE FOR ALIGNING AND CUTTING LENGTHS OF MATERIAL

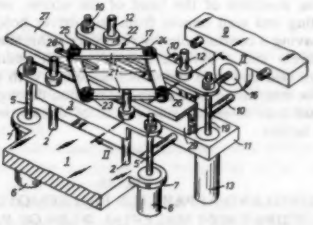
Conrad Arbter, Saal, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Sep. 3, 1986, Ser. No. 903,278

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1985, 3531553

Int. Cl.⁴ B26D *7/02, 7/14*

U.S. Cl. 83—175 **7 Claims**



1. A device for aligning and cutting material having at least two thickened material portions separated by a thin material portion and which material is fed in a feed direction, comprising first and second material bearing plates, means mounting said first and second plates for movement toward and away from each other parallel to the feed direction, first drive means connected to said plates for moving said plates relative to each other parallel to the feed direction, an aligning ledge carried by each of said bearing plates and having a substantially vertical aligning edge, means mounting each aligning ledge for movement upwardly and downwardly over each respective bearing plate for aligning said aligning ledge for engagement of its aligning edge with a respective thickened material portion, second drive means connected to each aligning ledge for moving said aligning ledge upwardly and downwardly with respect to its associated bearing plate, a support piece mounted between and above said first and second bearing plates, a parallelogram frame having first and second opposing joints connected to respective aligning ledges and third and fourth opposing joints connected at spaced locations to said support

piece, and a cutting device mounted on said support piece in a position to cut the thin material position between said aligning ledges, said support piece being held by said paralelogram frame so that said cutting device is in a plane in the middle between the two aligning edges.

4,704,929

DEVICE FOR SETTING SCREW

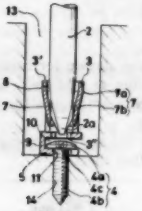
Hiroshi Osada, Yokohama, Japan, assignor to Nifco Inc., Yohohama, Japan

Filed Nov. 12, 1985, Ser. No. 796,856

Claims priority, application Japan, Nov. 19, 1984, 59-174352[U]

Int. Cl.[4] B25B *23/08*

U.S. Cl. 81—451 3 Claims



1. A device for setting a screw, comprising a cylindrical driver holder for holding an end of an inserted driver, a screw holder integral with the lower end of said driver holder for holding a head of a screw against vertical movement after said screw is fitted sidewise therein, and at least one elastic pawl projecting into the bore of said cylindrical driver holder for temporarily agressively retaining the inserted driver, said screw holder comprising a partially enclosing, axially extending wall having a radially opening slot therein for receiving sidewise insertion of the head of the screw, and a radially extending end wall remote from said driver holder, said end wall having a central hole for receiving a threaded portion of said screw and a peripheral guide notch opening radially through said end wall and communicating with said hole for sidewise insertion of said threaded portion through said notch into said hole to enable sidewise fit of the screw within said screw holder.

4,704,930

METHOD AND APPARATUS FOR REMOVING EDGE STRIPS FROM MATERIAL WEBS OF PAPER, CARDBOARD OR THE LIKE

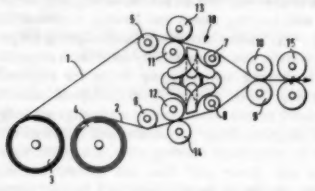
Jakob Bödewein, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Jagenberg AG, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 729,383, May 1, 1985, abandoned. This application Oct. 15, 1986, Ser. No. 919,629

Claims priority, application Fed. Rep. of Germany, May 3, 1984, 3416341

Int. Cl.[4] B26D *1/143, 1/24*

U.S. Cl. 83—24 12 Claims



1. A method of removing edge strip from webs of paper, cardboard, or the like, comprising providing two webs, passing the webs onto first guide rollers to space the two webs apart with one web over the other, passing the webs through second guide rollers downstream of the first guide rollers to dispose the webs in a superposed relationship, and between the first and second guide rollers, cutting each web along at least one edge longitudinally by pairs of circular cutters each pair including a point cutter and a pot cutter to form edge strips, guiding the cut edge strips from outer edges inwardly over the pot cutter and removing the edge strips with removing means associated with each cutter.

4,704,931

ACOUSTIC TONE INHIBITING MEANS FOR KEYBOARD MUSICAL INSTRUMENT

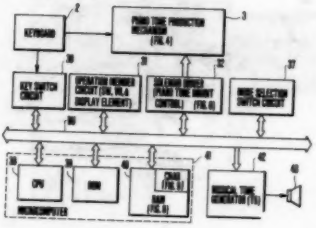
Yohei Nagai, and Yoshimasa Isozaki, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Jun. 16, 1986, Ser. No. 874,589

Claims priority, application Japan, Jun. 17, 1985, 60-131611

Int. Cl.[4] G10C *5/00;* G10F *1/22;* G10H *5/00*

U.S. Cl. 84—1.01 4 Claims



1. A keyboard musical instrument comprising:

a keyboard having a plurality of keys;

acoustic musical tone generating means for generating an acoustic musical tone by using a mechanical mechanism upon operation of a key;

electronic musical tone generating means for generating an electronic musical tone upon operation of a key;

tone designating means for designating a musical tone to be inhibited; and

acoustic tone inhibiting means for automatically inhibiting generation of said acoustic musical tone from said acoustic musical tone generating means when said designated musical tone is said acoustic musical tone.

4,704,932

ELECTRONIC MUSICAL INSTRUMENT PRODUCING LEVEL-CONTROLLED RHYTHMIC TONES

Junichi Mishima, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 16, 1986, Ser. No. 920,147

Claims priority, application Japan, Oct. 21, 1985, 60-161165

Int. Cl.[4] G10H *1/22, 1/42, 1/46*

U.S. Cl. 84—1.03 5 Claims

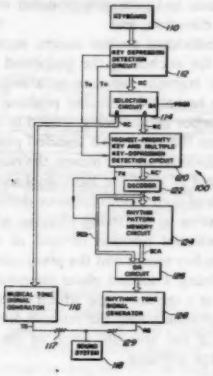
1. An electronic musical instrument comprising:

rhythmic tone signal forming means having a plurality of tone signal sources for respectively outputting tone signals which form a rhythmic tone signal;

a plurality of switch means each for designating a respective one of said plurality of tone signal sources, each of said switch means outputting a tone source designating signal when manipulated;

detection means coupled to said plurality of switch means for detecting a simultaneous manipulation of more than one of said switch means to output a detection signal;

signal selection means responsive to said detection signal for selectively outputting one of those tone source designating signals outputted from the switch means simultaneously manipulated, said signal selection means outputting the tone source designating signal from the manipulated switch means when said detection signal is not received, the tone source designating signal outputted from said signal selection means driving a corresponding one of said tone signal sources for causing the tone signal to be outputted therefrom; and



tone volume control means responsive to said detection signal for controlling a signal level of said rhythmic tone signal.

4,704,933

APPARATUS FOR AND METHOD OF PRODUCING AUTOMATIC MUSIC ACCOMPANIMENT FROM STORED ACCOMPANIMENT SEGMENTS IN AN ELECTRONIC MUSICAL INSTRUMENT

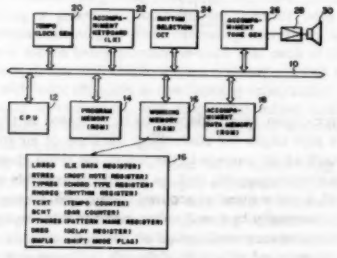
Yasushi Kurakake, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 26, 1985, Ser. No. 813,495

Claims priority, application Japan, Dec. 29, 1984, 59-276696

Int. Cl.[4] G10H *1/42, 7/00*

U.S. Cl. 84—1.03 **21 Claims**



17. A method of automatically producing accompaniment in an electronic musical instrument, comprising the steps of:

storing segment data representing a predetermined arrangement of a plurality of accompaniment segments which make up an accompaniment pattern of predetermined length;

storing order data representing notes of said accompaniment segments and order in which said accompaniment segments are to be aligned sequentially;

generating tempo clock pulses corresponding to the tempo of desired music accompaniment performance;

reading out stored accompaniment segment data in accordance with the predetermined arrangement;

reading out stored order data corresponding to a presently designated accompaniment segment of said segment data and in accordance with the tempo clock pulses thereby to align the read out order data to the tempo or the accompaniment performance; and

generating an accompaniment tone in accordance with the resulting aligned order data.

4,704,934

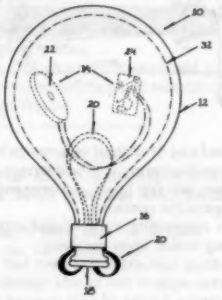
MUSICAL BALLOON

Mohammad Nosrati, 331 Phillip Dr., #307, Daly City, Calif. 94015

Filed Jan. 20, 1987, Ser. No. 5,479

Int. Cl.[4] G10F *1/06*

U.S. Cl. 84—94.2 **5 Claims**



1. A musical balloon, comprising,

an inflatable balloon of stretchable, rubbery wall material having a preselected degree of opacity when deflated and capable of stretching and thinning in its wall as it is inflated, producing lesser and lesser degrees of opacity in the balloon wall,

an electronic musical melody module contained within the balloon, including a speaker, an integrated circuit tone modulator and a battery, and

light sensitive switch means connected to the melody module for activating the melody module only when a preselected level of light permeates the balloon wall and strikes the switch means,

whereby the melody module is switched off and silent when the balloon is deflated, but is activated by the light-sensitive switch means when the balloon is inflated to the extent that the balloon wall is stretched and thinned enough to let outside light penetrate the balloon wall to said predetermined level.

4,704,935

STRINGED MUSICAL INSTRUMENT

Paulie H. Franklin, 712 May Dr., Madison, Tenn. 37115

Filed Oct. 3, 1986, Ser. No. 914,823

Int. Cl.[4] G10D *3/14*

U.S. Cl. 84—312 P **11 Claims**

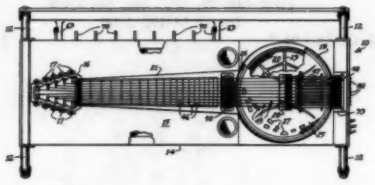
1. A stringed musical instrument comprising:

(a) an elongated hollow body having head and tail end portions and top and bottom surfaces,

(b) a dished resonator mounted in said top surface adjacent said tail end portion,

(c) a transverse bridge fixed on said resonator and projecting above said top surface,

(d) a head supporting a plurality of adjustable string pegs on said top surface adjacent said head end portion,
(e) an elongated fret board on said top surface extending from said head to said resonator,
(f) a tuning shaft,
(g) means supporting said tuning shaft on said tail end portion transversely of said body, spaced from and parallel to said bridge,
(h) a plurality of tuning lever members supported on said tuning shaft for independent pivotal movement on said tuning shaft,
(i) a transverse support rod fixed transversely over said resonator, spaced parallel to and between said bridge and said tuning shaft,
(j) a plurality of elongated string members, each string member comprising an elongated string and an elongated rigid string bar,



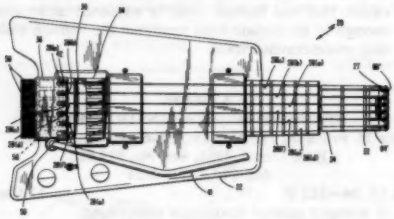
(k) the head end of each of said strings being connected to a corresponding string peg, said strings extending longitudinally over said fret board and over and against said bridge, in an operative position,
(l) means connecting each of said string bars to a corresponding tuning lever member,
(m) said string bars extending over and bearing against said transverse support rod in said operative position,
(n) the relative height of said support bar and said bridge being such as to minimize the pressure exerted by said strings against said bridge, and
(o) actuator means operatively connected to said tuning lever members to pivot said tuning lever members about said tuning shaft to vary the tension in said corresponding strings.

4,704,936

TREMOLO WITH LEVER ANGLE CONTROL

Ned Steinberger, Cornwall, N.Y., assignor to Steinberger Sound Corporation, Newburgh, N.Y.

Continuation-in-part of Ser. No. 656,501, Oct. 1, 1984, Pat. No. 4,632,005. This application Oct. 15, 1985, Ser. No. 787,444
Int. Cl.[4] G10D *3/12*
U.S. Cl. 84—313 **21 Claims**



1. An even tuning tremolo system for a stringed musical instrument having a body, a neck extending from the body, and strings having a neck end, a body end, and different pitch and tension characteristics relative to each other, comprising:

nut means on the neck and bridge means on the body for generally defining a string plane and a vibrating portion of the strings which extend in a longitudinal direction in the string plane;

a tremolo tailpiece mounted on the body, the tailpiece including means for pivoting the tailpiece within a range of pivoting positions relative to the body about a pivot axis, said pivot axis being generally parallel to but spaced from the string plane and generally oriented transverse to the longitudinal direction; and

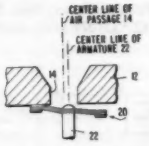
a plurality of individual anchor means, each individual anchor means for anchoring the body end of a respective string to the tremolo tailpiece at a respective selected position, the respective selected position of at least one individual anchor means being spaced in the longitudinal direction from the respective selected position of at least one other individual anchor means, the respective selected position of said at least one individual anchor means and the pivot axis of the tremolo tailpiece defining a first plane oriented relative to the string plane at a first angle, the respective selected position of said at least one other individual anchor means and the pivot axis of the tremolo tailpiece defining a second plane oriented relative to the string plane at a second angle which is different from the first angle for maintaining the relative pitch of the strings while varying the absolute pitch of the strings during pivoting of the tailpiece.

4,704,937

PIPE ORGAN VALVE

Paul A. Klann, P.O. Box 2398, Waynesboro, Va. 22981

Filed Nov. 25, 1986, Ser. No. 934,971
Int. Cl.[4] G10B *3/06*
U.S. Cl. 84—339 **12 Claims**



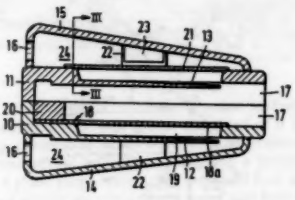
1. A pipe organ valve adapted to be mounted in the wind chest of a pipe organ for controlling the flow of air to an air pipe through an air passage in the top of the wind chest comprising an electromagnetic coil, an armature moveable relative to said coil, a valve member secured to said coil, spring means adapted to normally bias said valve member into engagement with a valve seat surrounding said air passage; said valve member being comprised of a disk of flexible, soft material and an annular ring of semi rigid flexible material normally disposed in a flat plane and secured about the periphery of said disk on the side thereof opposite the side of the disk adapted to engage the valve seat whereby the disk can flex in opposite directions relative to the plane of the ring on movement of the valve member into engagement with the valve seat to gradually absorb the inertia of the armature to prevent bounce of the valve member relative to the valve seat.

4,704,938

MOUTH ORGAN

Ernst Zacharias, Trossingen, Fed. Rep. of Germany, assignor to Matt H. Hohner AG, Trossinger, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 721,388, Apr. 9, 1985, abandoned. This application Dec. 30, 1986, Ser. No. 947,622
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1984, 3413383
Int. Cl.[4] G10D 7/12
U.S. Cl. 84—377 8 Claims



1. A mouth organ comprising:

means defining a body, said body defining means having a plurality of generally parallel wall members which define therebetween individual voice channels, said body defining means further having first and second plates extending generally parallel to each other and bridging said wall members, each of said plates having a slot therethrough in registration with one of said voice channels;

a plurality of pressure-excited reeds, said pressure-excited reeds being mounted so that individual of said pressure-excited reeds are disposed in front of respective slots in the first of said body defining means plates, said pressure-excited reeds being positioned within said voice channels;

a plurality of suction-excited reeds, said suction-excited reeds being mounted so that individual of said suction-excited reeds are disposed in front of respective slots in the second of said body defining means plates, said suction-excited reeds being positioned outside of said voice channels;

cover means, said cover means cooperating with said body means so as to define an outlet plenum chamber at the side of said slots in said body defining means first plate disposed oppositely to said voice channels and an inlet plenum chamber at the side of said slots in said body defining means second plate disposed oppositely to said voice channels;

first valve means for controlling air flow through said slots in said second plate of said body defining means, said first valve means being comprised of flexible sheet material and having a generally comb-shaped contour with a base portion and integral teeth extending therefrom, said first valve means being positioned such that each of the teeth which define said comb-shaped contour extends into one of said voice channels in overlapping relationship to a slot in said second plate, said first valve means teeth being disposed at the opposite ends of said slots with respect to suction-excited reeds; and

second valve means, said second valve means being formed of a single rectangularly shaped solid piece of sheet material and being positioned in said outlet plenum chamber, said second valve means cooperating with the slots in said body defining means first plate, said second valve means being disposed at the ends of said slots opposite to said pressure-excited reeds and being freely movable perpendicularly with respect to the plane defined by the pressure-excited reeds;

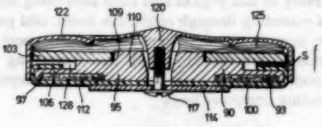
whereby when pressurized air is forced into the voice channels said second valve means is lifted from said first plate to open the slots in the first plate and when air is drawn from the voice channels said second valve means is drawn against said first plate to cover and seal the slots therein.

4,704,939

TONE HOLE PAD FOR WIND INSTRUMENTS, PARTICULARLY FLUTES

David Straubinger, 2521 E. Southport Rd., Indianapolis, Ind. 46227

Filed Oct. 25, 1985, Ser. No. 791,513
Int. Cl.[4] G10D 9/04
U.S. Cl. 84—385 P 25 Claims



1. A pad for closure of a wind instrument tone hole, comprising a backing disc having a peripheral groove extending into the edge thereof; one side of said disc having a sealing skin and being bendable out of its plane within a ringlike area determined by the depth of said groove and to a measurable extent by a tool insertable into said groove at a point predetermined by detection of a leakage gap between said sealing skin and a tone hole pad seat at said point;

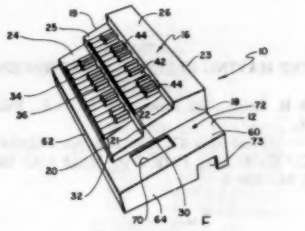
whereby inaccuracy of closure between said pad and pad seat can be corrected by bending said one side at said point to correct leakage thereat.

4,704,940

COMPUTER KEYBOARD ADAPTOR

Darold B. Cummings, 18720 Kornblum Ave., Torrance, Calif. 90504

Filed Sep. 5, 1984, Ser. No. 647,440
Int. Cl.[4] G10C 3/12
U.S. Cl. 84—425 17 Claims



1. An adaptor device for a computer comprising:

a computer, said computer having a keyboard;

a rigid housing adapted to be removably disposed over said keyboard, said housing having a base wall which overlies said computer keyboard, said base wall having a cutout therein;

a plurality of first, second, third, and fourth keys pivotally mounted to said housing, said first keys being longer than said second keys, said third keys being longer than said fourth keys, said first and second keys being arranged in a first row, said third and fourth keys being arranged in a second row which is spaced from said first row, said first and second rows being substantially parallel, said second row positioned above said first row, said second keys being spaced from each other by at least one of said first keys, said fourth keys being spaced from each other by at least one of said third keys, said first, second, third, and fourth keys being positioned to register with selected computer keys when said housing is positioned over said keyboard, said cutout providing access to allow said first, second, third, and fourth keys to register with selected

computer keys, said first, second, third, and fourth keys having a means for contacting selected computer keys, said first, second, and third keys each having a peg mounted to the bottom thereof which is used for contacting a selected computer key; and

a row of holes, said holes passing through selected first and second keys, there being at least a portion of one of said holes in each of said selected first and second keys, a plurality of said pegs of said third keys being aligned with and extending through respective holes, said pegs of said first, second, and third keys being in alignment with said selected computer keys such that depressing said first, second, and third keys will respectively depress corresponding computer keys.

4,704,941

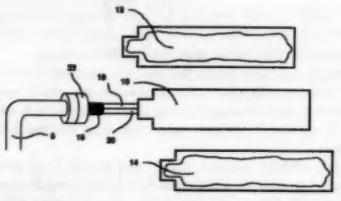
GUITAR HAVING ELECTRO-LUMINESCENT LIGHT SYSTEM

Kenneth B. Reilly, 781 Delmonico St. N.E., Palm Bay, Fla. 32907

Filed May 12, 1986, Ser. No. 862,016

Int. Cl.[4] G10D *1/08*; F21K *2/00*; H01J *1/62*; H05B *33/04*

U.S. Cl. 84—464 A **31 Claims**



1. A light system for a musical instrument having an electrical pickup whereby the sound therefrom may be amplified, comprising:

light generating means, connectable to said musical instrument;

shielding means, connected to said light generating means, for attenuating electrical signals from said light generating means whereby interference with said electrical pickup is minimized; and

control circuit means, connected to said light generating means, for controlling said light generating means.

4,704,942

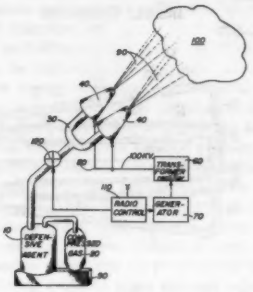
CHARGED AEROSOL

Irving F. Barditch, 4007 Rosecrest Ave., Baltimore, Md. 21215

Filed Aug. 1, 1986, Ser. No. 892,566

Int. Cl.[4] F41H *11/00, 13/00*

U.S. Cl. 89—1.11 **7 Claims**



1. A method of defending against a warfare cloud of toxic aerosol comprising charging a defensive aerosol to at least 10,000 volts and spraying the aerosol into the warfare cloud.

4,704,943

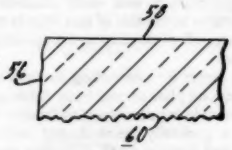
IMPACT STRUCTURES

John A. McDougal, 14388 Harbor Island, Detroit, Mich. 48215

Continuation of Ser. No. 273,965, Jun. 15, 1981, abandoned. This application Jan. 25, 1985, Ser. No. 695,411

Int. Cl.[4] F41H *5/02*

U.S. Cl. 89—36.02 **7 Claims**



1. A structure for resisting the impact of a forcible collision with an object, comprising:

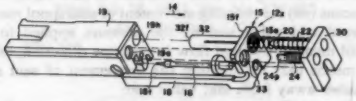
a body capable of transmitting a coherent sonic energy wave train through said body created in response to said collision between said body and said object, and having a first surface engageable with said object and a second surface generally opposing said first surface; and

means for suppressing the reinforcing intersection of said sonic velocity wave train with its own reflection within said body by diffusing internal acoustic reflections of said sonic velocity wave train at said second interface of said body and suppressing specular reflection of said sonic energy wave train at said second interface of said body, said means comprising random irregularities formed at said second surface of said body and sized in a predetermined relationship with the wavelength of said sonic energy such that said irregularities are several times the wavelength of said sonic energy.

4,704,944
SEMI-AUTOMATIC PISTOL

Iancu Bercu, Petah-Tikva, Israel, assignor to The State of Israel, Ministry of Defence, Military Industries of Israel, Ramat-Hasharon, Israel

Continuation of Ser. No. 568,628, Jan. 6, 1984, abandoned. This application Jul. 11, 1986, Ser. No. 884,665
Int. Cl.[4] F41D *11/04*
U.S. Cl. 89—132 **5 Claims**



1. In a semi-automatic blowback pistol including a bolt having a rearmost face that drives aft ahead of it from a forward firing position to a rearward cocked position a striker assembly, the striker assembly comprising a striker plate extending in a plane perpendicular to its aft and fore motions and supporting a striker pin extending toward said bolt and further comprising a first return spring, the improvement comprising

a hollow cylindrical sleeve with a closed front end extending toward the bolt from a hole in said striker plate, said closed front end of said sleeve being disposed aft of said bolt rearmost face when said striker assembly is in its cocked position,

a substantially stationary end plate supporting a first post on which one end of said first return spring is supported, the first return spring extending over said first post and into said sleeve through said hole, wherein when said striker assembly moves aft to said cocked position said first post and first return spring enter said sleeve,

means in the bolt, for accommodating said sleeve when the bolt moves aft,

a body, said bolt moving forwardly and rearwardly in said body,

said end plate being disposed at the rearward end of said body and supporting forwardly extending first and second post assemblies, said second post assembly including said first post and said first return spring with said first return spring mounted concentrically about said first post, and said first post assembly including a further post with a further return spring mounted concentrically about said further post, said further post of said first assembly being longer than said first post of said second assembly,

said striker plate being disposed between said bolt and said end plate, and including first and second openings, said first and second post assemblies being aligned with, and passing through, respective ones of said first and second openings, and

means, in said bolt, for accommodating said sleeve when said striker assembly moves forward to said firing position,

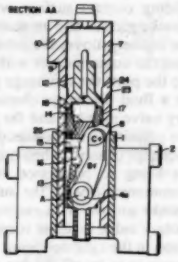
wherein when said striker assembly moves to said cocked position, said striker plate abuts said end plate and said hollow sleeve is disposed rearwardly of said bolt rearmost face, and when said striker assembly moves to said firing position, said striker plate is spaced from said end plate and abuts said bolt rearmost face.

4,704,945
CONTROLLED PERCUSSION DEVICE FOR AUTOMATIC WEAPON

Joël M. Marcon; Jacques A. Durant, both of Bourges, and Georges H. Simon, Saint-Germain du Puy, all of France, assignors to Etat Francais, Paris, France

Filed Jun. 3, 1986, Ser. No. 869,892
Claims priority, application France, Jun. 7, 1985, 85 08601
Int. Cl.[4] F41D *11/04*
U.S. Cl. 89—185 **11 Claims**

1. A percussion device for an automatic weapon with a barrel comprising: a carrier piece moving alternately in opposite directions parallel to the barrel centerline; a movable bolt head adapted to come up against the barrel, carried by the carrier piece and slidable translationally with respect to the carrier piece along a first course of travel during which the movable bolt head is locked on the barrel and at the end of which a percussion takes place, then a second course of travel during which recoil shock is absorbed; and a firing pin slidable

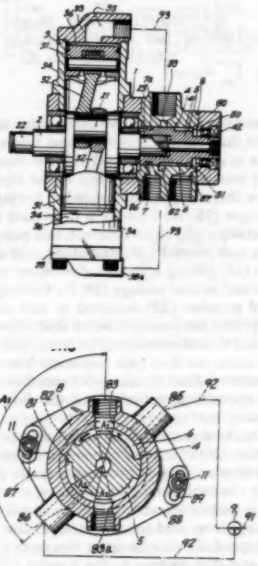


in the movable bolt head, the percussion device further comprising linking means for creating a first link wherein the firing pin is fixedly linked to the carrier piece during the first course of travel and for creating a second link wherein the firing pin is fixedly linked to the movable bolt head during the second course of travel, said linking means operable to create said first and second links consecutively.

4,704,946
FLUID MOTOR WITH ROTARY OUTPUT

Minoru Okada, Suita, Japan, assignor to Osaka Taiyu Co., Ltd., Osaka, Japan

Filed Aug. 20, 1986, Ser. No. 897,967
Int. Cl.[4] F01L *33/02*; F15B *11/08*
U.S. Cl. 91—7 **7 Claims**



1. A fluid motor wherein reciprocation of a piston within a

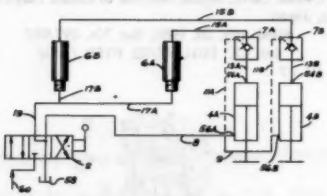
cylinder is converted to rotation by a crankshaft and which includes a valve for supplying a fluid to the cylinder and discharging the fluid therefrom, the valve comprising a rotary valve member rotatable with the crankshaft and a fixed valve body slidably in contact with the rotary valve member, the fixed valve body being formed with a fluid intake main port, a fluid intake subport and a cylinder connection port, the cylinder connection port being in communication with an intake-discharge port of the cylinder, the rotary valve member being formed in its sliding contact surface with a fluid discharge groove, a fluid intake groove and an auxiliary groove communicating with the intake groove, the intake groove permitting the connection port to communicate with the intake main port when opposed to the port, the discharge groove being in communication with a fluid discharge channel formed in one or each of the rotary valve member and the fixed valve body, the discharge groove permitting the connection port to communicate with the discharge channel when opposed to the port, the auxiliary groove being so positioned relative to the intake subport as to communicate with the subport when the rear portion of the intake groove with respect to the direction of rotation of the rotary valve member is opposed to the connection port, the piston in the cylinder being so positioned relative to the intake groove as to be off the top dead point or bottom dead point when the front to middle portion of the intake groove with respect to the direction of rotation of the rotary valve member is opposed to the connection port.

4,704,947

BIDIRECTIONAL FLUID FLOW VALVE

Robert H. Schneider, Beaver Dam, Wis., assignor to Versa Technologies, Inc., Racine, Wis.

Filed Oct. 21, 1985, Ser. No. 789,518
Int. Cl.[4] F15B *15/22*
U.S. Cl. 91—518 **6 Claims**



1. A fluid flow control valve suitable for insertion in a line in which the fluid flow is reversible and having increasible flow resistance in one direction, said valve comprising:

a body member (**10**) couplable to the line for inserting the valve therein, said body member having first and second passages (**16, 18**) forming a flow path through the body generally along an axis thereof, said passages being contiguous and generally aligned along said axis, said first passage (**16**) having a smaller dimension normal to said axis than said second passage (**18**) for forming a valve seat (**20**);

a spool member (**22**) mounted in said second passage for reciprocal movement toward said valve seat by pressure applied to said spool member from fluid flow in one direction along the flow path and away from said valve seat by pressure applied to said spool member from fluid flow in the opposite direction along the flow path, said spool member having a tubular body portion (**24**) mating with said second passage, said spool member having a nozzle portion (**26**) of smaller dimension normal to said axis than said tubular body portion, said nozzle portion being sealingly abuttable with said valve seat when said spool member is moved toward said valve seat for sealing said first passage from said second passage, said nozzle portion of said spool member having a first orifice (**30**) communicating said first passage to the interior of said tubular body portion when said nozzle portion is sealingly abutted with said valve seat, and communicating said second passage to the interior of said tubular body portion when said nozzle portion is moved away from said valve seat, said first orifice having a dimension such as to increase flow resistance through said valve when said nozzle portion abuts said valve seat, said nozzle portion of said spool member having at least a second orifice (**32, 34**), communicating said second passage to the interior of said tubular body portion for providing an additional flow path when said spool member is moved out of abutment with said valve seat for reducing the flow resistance in said valve;

bias means (**40**) for resisting movement of said spool member toward said valve seat by the pressure applied to said spool member by fluid flow in said one direction; and

limit means (**42**) for limiting the movement of said spool member away from said valve seat;

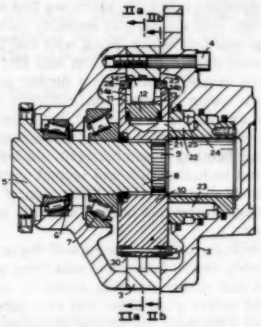
wherein said line passes fluid in said one direction from a first fluid operated cylinder when said cylinder is operated to relieve the load thereon, said line being connected in parallel with a line passing fluid from a second fluid operated cylinder, said first and second fluid operated cylinders each sharing a percentage of a common load, and wherein said first orifice is sized such that the percentage of the fluid flow available to said cylinders passing through said first orifice when said nozzle portion is sealingly abutted with said valve seat is less than the percentage of the common load carried by either said first or said second fluid operated cylinder.

4,704,948

RADIAL PISTON MACHINE

Peter Wüsthof, Lohr, Fed. Rep. of Germany, and Sinclair Cunningham, Kinghorn, Scotland, assignors to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Jul. 29, 1986, Ser. No. 893,893
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1985, 3530979
Int. Cl.[4] F04C *9/00*
U.S. Cl. 92—58 **4 Claims**



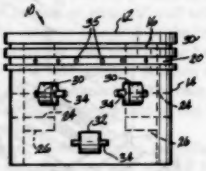
1. In a radial piston machine, comprising a housing, a ring-shaped cam plate secured to the housing; a cylinder block supported in said housing rotationally about an axis of said cam plate, said cylinder block having a plurality of bores radially extending from an axis of rotation of said block; a plurality of pistons displaceably positioned in said bores; a plurality of cylindrical rollers supporting said pistons against said cam plate and each having an axis extending parallel to said axis of rotation, each piston having a transverse bore receiving at least partially a respective roller; and means for axially holding each roller in position in a respective transverse bore, said holding means including stops secured to said cylinder block and abutting against opposite end faces of the respective roller, the improvement comprising each piston including a curved web formed coaxially to an axis of the roller received in said piston,

said web surrounding said roller, said cam plate having a plurality of circular grooves each receiving the web of the respective piston.

4,704,949
PISTON

John D. Foster, Benbrook, Tex., assignor to Robert Ogg, Zanesville, Ohio and John H. Mulholland, Monroe, Conn., part interest to each

Filed Jul. 15, 1983, Ser. No. 513,812
Int. Cl.⁴ F16J 1/02
U.S. Cl. 92—160 **8 Claims**



1. An improved anti-friction piston for reciprocation in a cylinder comprising:

a head of circular cross section;

a skirt attached to said head;

a plurality of roller bearings, each bearing including multiple rollers mounted on an axle individually set in a separate straight groove in said skirt;

each of said grooves extending substantially perpendicular to a radius of said piston and opening radially outwardly;

a cavity in said skirt intermediate the length of each of said grooves in communication therewith and with the piston interior to receive a roller bearing therein;

said roller bearing grooves and cavities being arranged in a pair of symmetrically opposed triangles to provide the skirt with areas of three point stability within said cylinder.

4,704,950
PLUNGER PISTON FOR INTERNAL COMBUSTION ENGINES

Emil Ripberger, Remseck; Gotthard Stuska, Fellbach, and Reiner Ulrich, Weissach, all of Fed. Rep. of Germany, assignors to Mahle GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 760,117, Jul. 29, 1985, abandoned. This application Feb. 17, 1987, Ser. No. 15,317
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1984, 3430258
Int. Cl.⁴ F16J 1/04
U.S. Cl. 92—208 **4 Claims**

1. In a plunger piston for internal combustion engines, having a cylindrical piston head with an annular ring zone having annular grooves therein for receiving piston rings, a cylindrical piston skirt having a distal end, and gudgeon pin bosses with coaxial gudgeon pin bores therein for containment of a coacting gudgeon pin, said bosses extending perpendicularly from the piston head into a space within the piston skirt and having radially outer boss faces, the improvement comprising selecting the following ratios and dimensions

$(H/D)=0.20\text{-}0.35$

$(T/D)=0.22\text{-}0.38$

$(A/D)=0.15\text{-}0.25$

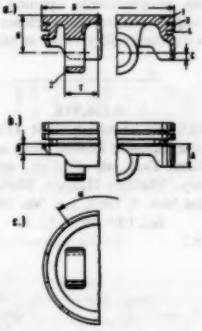
$(B/D)\leqq(A/D)$

wherein D=piston diameter

H=compression height between a top of the head and the gudgeon pin bore axis

T=distance from the radially outer boss faces to the piston axis

A=axial skirt dimension below annular groove nearest the pin bore axis at a peripheral zone of the skirt extending over an angle α of 15 to 60 degrees to either side of a connecting rod oscillating plane



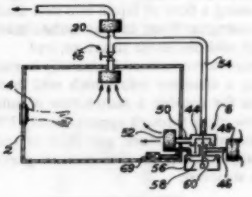
B=axial skirt dimension below said annular groove in a direction along said gudgeon pin axis;

and further wherein the distal end of the skirt is reduced radially over an axial dimension of 10–25% of an axial length of the skirt in said direction along said gudgeon pin axis, said distal end being reduced at its edge by 0.01–0.15 mm.

4,704,951
VENTILATION SYSTEM FOR AN ISOLATION ENCLOSURE

Philippe Pruchon, Bagnols sur Cèze, France, assignor to Cogema, Compagnie Generale des Matieres Nucleaires, France

Filed Dec. 11, 1985, Ser. No. 807,758
Claims priority, application France, Dec. 11, 1984, 84 18901
Int. Cl.⁴ B08B 15/00
U.S. Cl. 98—1.5 **8 Claims**



1. A ventilation system for an isolated, depressurized enclosure having an air admission and an air exhaust device, said air admission device comprising:

a valve body having an orifice therein and communicating on the one hand with an air admission pipe with the interior of said enclosure, so that air flowing from said air admission pipe flows into said enclosure through said orifice,

a regulating valve connected to the valve body for closing said orifice,

control means on said valve body for controlling said regulating valve, said control means being responsive to changes in the pressure in the interior of said enclosure, said regulating valve being opened by said control means when the pressure inside said enclosure is below a predetermined level,

an air exhaust pipe mounted on said valve body for exhausting air from inside said enclosure when vacuum inside said enclosure decreases, said air exhaust pipe being in fluid communication with said valve body

a low-vacuum safety valve mounted on said valve body for closing said air exhaust pipe,

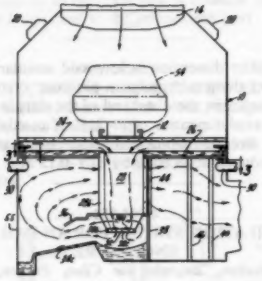
said control means for controlling the regulating valve further comprising displacing means on said value body for displacing said low-vacuum safety valve, said control means and said displacing means progressively opening said low-vacuum safety valve as said regulating valve closes and progressively closing said low-vacuum safety valve as said regulating valve opens.

4,704,952

METHOD AND APPARATUS FOR APPLYING PAINT

Jeffrey C. Johnson; Stephen Rothon, both of Birmingham, and Andrew J. Slater, Troy, all of Mich., assignors to Hayden Schweitzer Corp., Madison Heights, Mich.

Filed Nov. 7, 1985, Ser. No. 795,856
Int. Cl.[4] B05B *15/12*
U.S. Cl. 98—115.2 **17 Claims**



1. For use in combination with a work station in which air-borne particulates are generated, a wet scrubber apparatus comprising:

a generally horizontal partition and a tubular discharge structure depending from said partition;

means causing a flow of liquid into said discharge structure;

means causing a flow of particulate-laden air into and through said discharge structure; and

means cooperative with said generally horizontally partition defining a chamber into which said discharge structure projects for causing a redirection of substantially all of said flow of air through approximately 270° after it leaves said discharge structure, said flow of redirected air also externally passing an intermediate portion of said discharge structure.

4,704,953

POWDER SPRAY SYSTEM

Scott T. Wilson, Bay Village, Ohio, assignor to Nordson Corporation, Westlake, Ohio

Filed Nov. 12, 1986, Ser. No. 930,008
Int. Cl.[4] B05B *15/12*
U.S. Cl. 98—115.2 **18 Claims**

1. A powder spray system comprising

a powder spray booth through which product is conveyed,

at least one powder spray gun associated with said booth for spraying powder onto products within said booth,

a chamber located adjacent said powder spray booth, said chamber containing a fan and final filters,

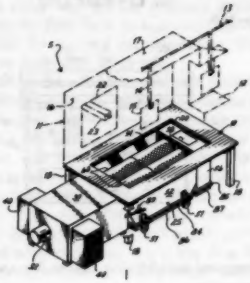
a powder collector in communication with said fan,

said powder collector having at least one filter cartridge and a powder collection hopper located beneath said cartridge, said powder collection hopper having a bottom wall, said bottom wall comprising a fluidizing plate through which air passes to maintain a fluidized bed of powder within said collection hopper,

a feed hopper,

a transfer pump for transferring powder from said collection hopper to said feed hopper,

a feed pump for transferring powder from said feed hopper to said spray gun,



a flexible hose for conveying powder into said transfer pump,

a sieve mounted upon the inlet end of said hose, and

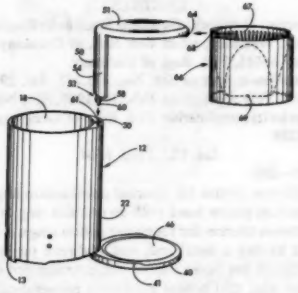
means for moving said sieve within said fluidized bed of said collection hopper so as to dislodge contaminants which collect on the sieve to facilitate transfer of powder through the sieve.

4,704,954

DRIP COFFEE MAKER

David V. Mollenhoff, 1501 Morrison St., Madison, Wis. 53703

Filed Nov. 10, 1986, Ser. No. 928,968
Int. Cl.[4] A47J *31/057*
U.S. Cl. 99—279 **27 Claims**



1. A self-contained hot beverage or drip coffee maker comprising:

(a) a base unit including an open top end, a closed bottom end, an interior including an interior side wall and an interior bottom wall, and an exterior wall,

wherein said interior is adapted to receive water for heating,

said closed bottom end containing means for heating water,

said base unit further including a first conduit located between said interior side wall and said exterior wall for

directing heated water toward an outlet in said open top end of said base unit;

(b) a hot beverage holder removably internested in the interior of said base unit and adjacent said interior side wall of said base unit,

said beverage holder having an interior portion being adapted to receive said hot beverage;

(c) a beverage mix storage container for holding dried beverage mix, said container being removably internested in said interior of said hot beverage holder; and

(d) a beverage filter basket assembly including a filter basket having an open top portion and being positioned in a storage position adjacent said top portion of said base unit, said filter basket having an exterior wall which, is of the same shape as the exterior side wall of the base unit and is aligned with the exterior side wall of the base unit when the filter basket is in said storage position such that the exterior walls of the filter basket and the base unit together comprise a contiguous outer surface of the hot beverage or drip coffee maker,

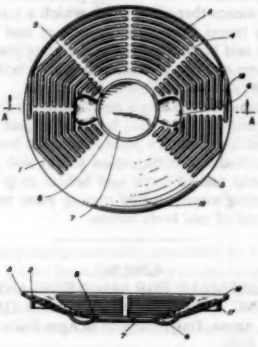
said beverage filter basket further including means for receiving a beverage filter and a filter basket holder which is removably positioned on said base unit adjacent said top portion of said filter basket, said filter basket holder supporting the filter basket and including an interior wall and an exterior wall, said filter basket holder further including a second conduit having an inlet communicating with said first conduit for directing heated water to said open end of said beverage filter basket.

4,704,955

COOKING APPARATUS

Stephen J. Archibald, P.O. Box 78313, Sandton, South Africa (2146)

Filed Jul. 17, 1986, Ser. No. 887,548
Int. Cl.[4] A47J *37/07*
U.S. Cl. 99—339 **20 Claims**



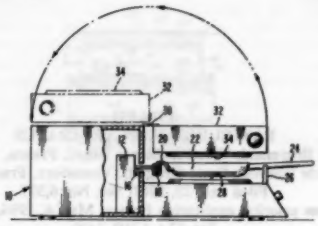
1. A cooking apparatus comprising a shallow cooking dish with an inner side having a uniformly continuous concave shaped food receiving surface portion and an outer side having a convex-shaped portion adapted to be heated by a heat source directed to said outer side of said dish, said inner side of said dish including a substantially flat circularly shaped bottom and a truncated conically-shaped side portion extending from said bottom and together with said bottom forming an interior for said food receiving portion and defining said concave-shaped food receiving portion, and a multiplicity of raised formations covering at least a major portion of said concave surface of the dish spaced from said flat bottom and substantially concentric therewith.

4,704,956

COOKING APPARATUS

William H. Gill, Rte. 179, Lambertville, N.J. 08530

Filed Dec. 22, 1986, Ser. No. 944,088
Int. Cl.[4] A22C *7/00*
U.S. Cl. 99—427 **12 Claims**



1. A cooking apparatus comprising:

(a) housing;

(b) motive means therein including an arm projecting from the housing, and means for reciprocating said arm;

(c) an upwardly facing heating element mounted in said housing forwardly of said arm;

(d) a cooking vessel including a handle, said arm and said vessel including cooperating means for detachably connecting the cooking vessel to the arm; and

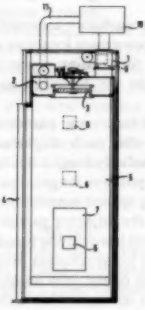
(e) means on the housing slidably supporting the handle, whereby to guide the cooking vessel in a straight path upon reciprocation of said vessel by the arm responsive to operation of the motive means, said heating element being disposed below the cooking vessel when the cooking vessel is so supported and reciprocated, whereby to cook the contents of the cooking vessel concurrently with reciprocation of the vessel above the heating means.

4,704,957

APPARATUS FOR OPERATING A SMOKING CHAMBER

Siegfried M. Kerres, Im Lerchenberg 20, 7057 Winnenden 5, Fed. Rep. of Germany

Filed Jul. 10, 1985, Ser. No. 753,642
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1984, 3429266
Int. Cl.[4] A23L *3/32*; A23B *4/04*
U.S. Cl. 99—451 **7 Claims**



1. Apparatus for smoking products comprising a chamber having an internal space which can be loaded with the products to be smoked; a smoke generator connected with said internal space of said chamber for supplying smoke particles to said internal space; and an oscillation generator comprising an electromagnetic oscillator having at least one excitation mem-

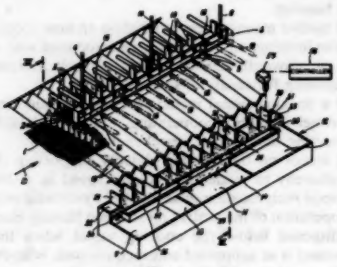
ber, said at least one excitation member being disposed in said internal space for subjecting said particles of smoke to thrusting sonic pulses, at least in the area of said products to be smoked, whereby said smoke particles are accelerated towards said products to be smoked.

4,704,958

PASTEURIZATION APPARATUS

Robert Braymand, Villefranche sur Saône, France, assignor to Societe Nouvelle Baele Gangloff, Venissieux, France

Filed Jan. 23, 1987, Ser. No. 6,377
Claims priority, application France, Mar. 4, 1986, 86 03613
Int. Cl.[4] A23B 7/00
U.S. Cl. 99—470 9 Claims



1. A pasteurizing apparatus comprising:

conveyor means for longitudinally displacing a succession of foodstuff-holding containers to be pasteurized in a row along a treatment path from an upstream end to a downstream end thereof;

a manifold extending longitudinally along the path between the path ends;

a multiplicity of longitudinally spaced sprayers connected to the manifold and directed transversely at the containers in the path, whereby each container passes under a succession of such sprayers while moving between the path ends;

means including conduits connected to the manifold at upstream and downstream locations and at a central location therebetween for feeding respective liquids at different temperatures to the locations and therethrough to the manifolds;

a multiplicity of transverse partitions spaced axially along the manifold and each displaceable between a closed position substantially longitudinally blocking the manifold and an open position longitudinally unblocking it, each partition being spaced longitudinally by at least one such sprayer from the adjacent partitions, whereby when the partitions are all lowered the manifold is subdivided into a multiplicity of compartments into one of which the upstream conduit opens, into another of which the downstream conduit opens, and into a third of which the central conduit opens; and

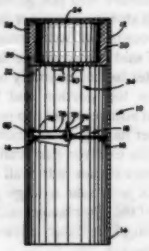
control means for selectively and controllably displacing the partitions between their positions and thereby subdividing the manifold longitudinally into upstream, downstream, and central zones into which the respective conduits open, at least one of the zones covering a plurality of the sprayers.

4,704,959

APPARATUS FOR CUTTING POTATOES AND ONIONS

David J. Scallen, 167 Moss Ridge, Pineville, La. 71360

Filed Jan. 22, 1986, Ser. No. 821,049
Int. Cl.[4] A47J 17/00
U.S. Cl. 99—538 19 Claims



1. An apparatus for cutting a potato into a helical strip having a rectangular cross-section comprising:

a. a hollow, generally cylindrical body means having a top end and a bottom end,

b. a cutting plate means having a top side facing toward said top end and a bottom side facing toward said bottom end, said cutting plate means being located in said body means for cutting a potato into a helical strip having a rectangular cross-section when a potato is inserted in said top end of said body means, forced against said top side of said cutting plate means and rotated around the longitudinal axis of said body means, said cutting plate means having a plurality of vertical blades on said top side for making vertical cuts in said potato as the potato is rotated, said vertical blades extending perpendicularly upward from the top side of said cutting plate means, and a horizontal blade spaced upwardly from said top side of said cutting plate means for cutting said potato horizontally as said potato is rotated, said cutting plate means having first opening means therein through which a portion of a potato may travel from said top side of said cutting plate means to said bottom side of said cutting plate means into said bottom end of said body means after being cut by said horizontal and vertical blade means, and

c. feeder means for forcing a potato into the top end of said body means and onto said top side of said cutting plate means and for rotating a potato about the longitudinal axis of said cylindrical body means to cut said potato into a helical strip and to force said helical strip through said first opening means in said cutting plate means into the bottom end of said body means.

4,704,960

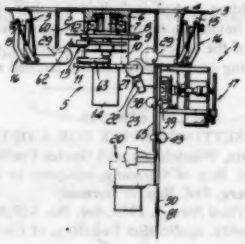
PRINT ASSEMBLY FOR MAGNETIC AND CLEAR PRINTING MAGNETIC CARDS AND THE LIKE

Cesare Bona, Arona, Italy, assignor to Ages Italia S.p.A., Borgo Ticino No, Italy

Filed Jul. 7, 1986, Ser. No. 882,328
Claims priority, application Italy, Jul. 11, 1985, 22479/85[U]
Int. Cl.[4] B41J 3/50
U.S. Cl. 101—93.12 10 Claims

1. A print assembly for magnetic and clear printing magnetic cards and the like, comprising a carousel element having circumferentially arranged support elements supporting each at least one stack of magnetic cards, actuation means drivingly connected to and rotating said carousel element for positioning one of said support elements on a magnetizing device for the cards, a clear printing device for the cards associated with said magnetizing device, transport means for transporting the cards from a said support element respectively to said magnetizing and clear printing devices, selector means for the cards ar-

ranged downstream of said printing device for separating valid cards from void ones, and at least one sensor for recognizing



the validity of the cards and correspondingly controlling said selector means.

4,704,961

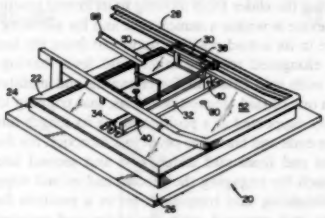
SCREEN PRINTING ASSEMBLY

Roger A. Jensen, 1922 Main, Kansas City, Mo. 64108, and John M. Wolfe, Kansas City, Mo., assignors to Roger A. Jensen, Kansas City, Mo.

Continuation-in-part of Ser. No. 629,571, Jul. 11, 1984, Pat. No. 4,545,300. This application Apr. 16, 1987, Ser. No. 723,930

Int. Cl.[4] B41F *15/00*

U.S. Cl. 101—114 **17 Claims**



1. A screen printing assembly attachable to a screen frame supporting a screen having a pattern comprising:

a support frame positionable adjacent and attachable to the screen frame,

a squeegee assembly movable relative to said support frame and positionable generally on the screen to press ink through the screen,

a chamber means connected to said support frame and positionable generally adjacent the screen for defining a sealed chamber in which said squeegee assembly presses the ink through the screen,

said sealed chamber including a chamber upper surface through which said squeegee assembly passes into said sealed chamber,

a depositing means operatively connected to said chamber means for depositing solvents into said sealed chamber, and

said sealed chamber being adapted to contain within the solvents deposited by said depositing means.

4,704,962

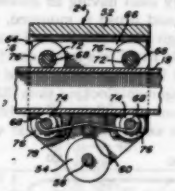
PRINTING MACHINE

Robert Healey, 425 Lajeunesse, Ste. Dorothée, Laval, Que. H7X 1R8, Canada

Filed Oct. 15, 1985, Ser. No. 787,078

Int. Cl.[4] B41F *3/04*

U.S. Cl. 101—269 **16 Claims**



1. A printing machine for printing on forms of varying thickness from a surface having embossed characters thereon, comprising:

a base;

print bed means on the base for holding embossed printing characters facing upwards;

elongate member having a rectangular cross section, the member positioned above, extending across and parallel to the print bed means and supported from the base;

roller head carriage positioned about the elongate member for reciprocal movement thereon;

print roller platen supported from the center of the carriage beneath the elongate member, adapted to roll in either direction over the embossed printing characters on the print bed means when the carriage moves along the elongate member;

guide frame means within the carriage having two end stabilizer plates supporting four guide rollers in a rectangular configuration positioned therebetween, two of the four guide rollers being top guide rollers rolling on top of the elongate member, and the other two of the four guide rollers being lower guide rollers rolling underneath the elongate member, the two lower guide rollers positioned above the print roller platen equispaced from the center of the carriage and in a triangular configuration with the print roller platen, the four guide rollers restricting tipping of the guide frame means relative to the elongate member;

side guide rollers positioned axially on and at each end of the four guide rollers adjacent the elongate member, the side guide rollers restricting slewing of the guide frame means relative to the elongate member;

the guide frame means attached to the carriage and having limited vertical movement relative to the carriage; and

spring bias means pressing the two lower guide rollers vertically upwards against the elongate member, so the print roller platen is at it's lowest position and can move upwards for the limited vertical movement against the spring bias means to take into account different thicknesses of embossed characters and forms, and apply even printing pressure.

4,704,963

DEVICE FOR CLEANING A TYPE-CARRIER

Hiroshi Nishimura, and Masao Miyasaka, both of Ibaraki, Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan

Filed Nov. 1, 1985, Ser. No. 794,031

Claims priority, application Japan, Nov. 2, 1984, 59-167082[U]

Int. Cl.[4] B41L *41/00*; B41J *1/20*; H46B *17/00*

U.S. Cl. 101—425 **10 Claims**

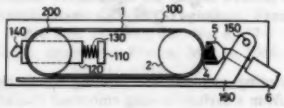
1. In a type-carrier cleaning device for cleaning a type-carrier (1) supported by at least two pulleys (2,200) so as to be able

to turn thereabout, said device including a brush (4) provided opposite one (2) of said pulleys with said type-carrier positioned therebetween, to thereby clean said type-carrier, and a suction hood (5) for rotatably supporting said brush, the improvement wherein said device further comprises:

a rotary shaft (3) passed through top and bottom portions of said suction hood and rotatably supported by said suction hood, said rotary shaft having an eccentric shaft portion (33) on which said brush is mounted, said rotary shaft extending through a hole (52) formed in said suction hood;

a collar (7) securely fitted to a lower end (35) of said rotary shaft below said bottom portion of said suction hood;

a plurality of engagement/locking slots (53) extending radially outward from a periphery of the hole (52), said slots being formed in said suction hood at various rotational



angeles around the hole with respect to an axis of said rotary shaft; and

an engagement/locking member (72), formed on a portion of said collar which engages with said suction hood at the hole, for engaging and disengaging with one of said engagement/locking slots as desired to thereby prevent said collar and said rotary shaft form rotating, said engagement/locking member being movable to a desired position for engaging with said one of said slots by rotating said rotary shaft when said engagement/locking member is disengaged, and said brush being moved relative to said type-carrier when said rotary shaft is rotated, whereby said brush may be selectively positioned more closely to said type-carrier as said brush is abraded, in accordance with the engagement/locking slot selected.

4,704,964

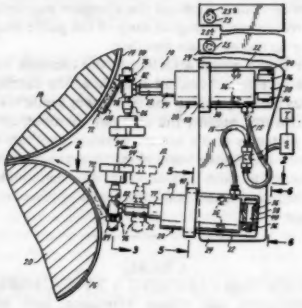
BEARER WIPER ASSEMBLY

Albert W. Robertson, Christopher, Ill., assignor to Air Stamping, Inc., Christopher, Ill.

Filed Feb. 7, 1986, Ser. No. 827,755

Int. Cl.[4] B41F *35/02*

U.S. Cl. 101—425 **6 Claims**



1. In a printing apparatus having rotatable bearer members, a wiper assembly comprising:

(a) a support means having an outstanding portion,

(b) a cylinder having an extensible piston mounted therein, the cylinder being pivotally mounted to the support means outstanding portion in swing-away relation about a pivot axis, the piston having a remote end,

(c) holding means between the cylinder and the support means releasably holding the cylinder to the support means in spaced relation from the pivot axis, and

(d) a bearer-engageable wiper means removably attached to the remote end of the piston,

(e) the holding means including a collar mounted to the cylinder having an outstanding portion and a cooperating portion of the support means engageable with said collar outstanding portion in releasably latched relation.

4,704,965

BLIND-SETTING DEVICE FOR A DETONATOR

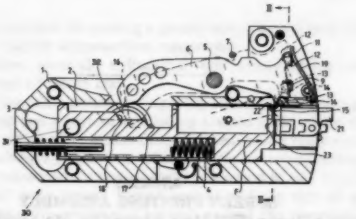
Bernhard Kratz, Wendelstein, and Gunter Postler, Rothenbach, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nurnberg, Fed. Rep. of Germany

Filed Nov. 7, 1986, Ser. No. 929,068

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1985, 3542209

Int. Cl.[4] F42C *9/06, 15/04, 15/28*

U.S. Cl. 102—226 **3 Claims**



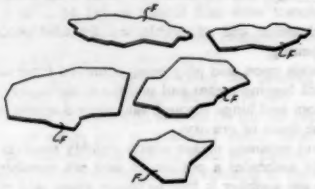
1. A blind-setting or protective blocking device for a detonator, especially the detonator of a launched bomb exiting from a launch tube, said device having a securing slider movable between one or more secured positions and an armed position, means for biasing the securing slider toward the armed position, releaseable means disposed in the path of the slider for preventing the slider from moving to its armed position so long as the device is within a launch tube and for allowing the slider to move to its armed position upon exit from the launch tube, and an elongated tripping lever, said lever having first and second ends said first end for engaging and maintaining said slider in one of said secured positions, said tripping lever being pivotably supported at a position along its length intermediate said two ends and biased to pivot in a direction for disengaging said first end from said slider, first and second latching elements each for engaging the second end of said tripping lever and maintaining said tripping lever in a position for keeping said first end engaged with the slider and maintaining said slider in a secured position, said latching elements operable to normally sequentially disengage from said second trigger lever end, said first latching element for normally disengaging while the device is within the launch tube and said second latching element for normally disengaging after the device exits the launch tube so that the slider will then move to its armed position, an improvement to prevent the movement of the slider to its armed position in the event the second latching element operates prior to the exit of the device from the tube, said improvement comprising a projection disposed on said tripping lever and normally out of the path of said securing slider but extending from said tripping lever and moveable therewith in a direction to intersect and block the path of said securing slider when said second latching element operates prior to the exit of the device from the tube and releases the tripping lever while said device is inside said tube, and contact stop means carried by said securing slider for engaging the projection means in the path of the slider and thereby arresting the movement of the slider before it travels to the armed position.

4,704,966

METHOD OF FORMING IR SMOKE SCREEN

Leonard R. Sellman, Anne Arundel; Janon F. Embury, Jr., and Werner W. Beyth, both of Baltimore, all of Md., assignors to AAI Corporation, Cockeysville, Md.

Filed May 16, 1986, Ser. No. 863,765
Int. Cl.[4] C06D *3/00*
U.S. Cl. 102—334 8 Claims



1. The method of screening against visual and infrared light transmission, comprising

injecting into the atmosphere a cloud of fine metal flakes comprised of a copper composition, in which the flakes are of submicron thickness and multimicron lateral face dimensions,

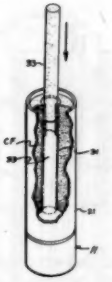
said cloud being formed by bursting a compacted generally cohesive solid mass of said metal flakes in the atmosphere to thereby aerosolize and disperse said flakes in the atmosphere.

4,704,967

METHOD OF ASSEMBLY OF COMPACTED PARTICULATES AND EXPLOSIVE CHARGE

Leon R. Milstead, Timonium; Laban R. Lowe, White Hall; Robert W. Schnepfe, Jr., Upperso, and Merlin L. Erickson, Perryman, all of Md., assignors to AAI Corporation, Cockeysville, Md.

Filed May 16, 1986, Ser. No. 863,762
Int. Cl.[4] C06D *3/00*
U.S. Cl. 102—334 13 Claims



1. The method of forming a product which may be explosively burst apart to form a visual and infrared screening cloud, comprising:

forming a slurry mixture of fine metal flakes and a volatile liquid in which said flakes are of greater density than said liquid to thereby wet the flakes, thereby causing said flakes to adhere to one another in a randomly stacked and self-compacted form at the bottom of said slurry mixture,

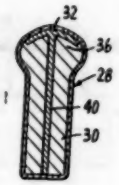
and enabling said volatile liquid to be removed from said mixture while maintaining said flakes in a nonaerosol compact adhered mass form, to thereby leave and form a compact mutually face-to-face adhered solid mass of said metal flakes.

4,704,968

PROJECTILE USING SHAPE-MEMORY ALLOY TO IMPROVE IMPACT ENERGY TRANSFER

Thomas O. Davis, Jr., 1950 Camino Redondo, Los Alamos, N. Mex. 87544

Filed Jun. 30, 1986, Ser. No. 880,022
Int. Cl.[4] F42B *11/10*
U.S. Cl. 102—517 13 Claims



1. A projectile, comprising:

a core; and

deforming means of shape-memory alloy in operative contact with said core, said deforming means altering the geometric shape of said core upon impact of the projectile due to shape-memory effect to improve the impact energy transfer of the projectile.

4,704,969

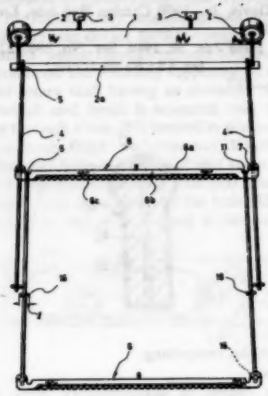
TRANSPORT MEANS WITH A FOLDABLE SUSPENSION CARRIER

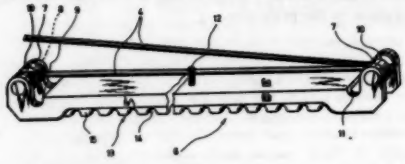
Rolf Schönenberger, Landsberg, Fed. Rep. of Germany, assignor to Veit GmbH & Co., Fed. Rep. of Germany

Filed Feb. 21, 1986, Ser. No. 832,156
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1985, 3509936
Int. Cl.[4] B60P *3/00*; B61B *3/00*
U.S. Cl. 105—148 10 Claims

1. A transport means, for a suspension transport system for internal transport, said system being of the type including a runner rail system roller sets resting on said runner rail system, including depending means for interconnecting the rollers in a set, said transport means comprising rail-shaped carrier members each having a longitudinal axis extending from one end to the other end thereof, and a carrier member support surface for supporting goods to be transported in a suspended condition, suspension rods releasably suspending said carrier members from said roller sets, pivot axle means provided at said one end and said other end of said carrier members for pivotally connecting said suspension rods to a carrier member by said pivot axles extending transversely to said carrier member support surface and being perpendicularly displaced relative to said longitudinal axis of said carrier member to such an extent that said suspension rods can be folded into contact with said carrier member support surface by means of pivoting by 90°, and said pivot axles further comprising a clamping groove arranged adjacent to the location of connection of said suspension rods, said clamping groove of a pivot axle arranged at

each end of a carrier member for clamping in said contact with said carrier member support surface a suspension rod con-





nected to a pivot axle arranged at the opposite end of said carrier member.

4,704,970

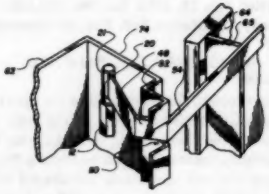
CONCEALED HINGE FOR LIGHTWEIGHT SAFES

Robert A. Sanderson, and Gaius P. Crosby, both of Orem, Utah, assignors to Thomas A. James, Mapleton, Utah

Filed Apr. 9, 1984, Ser. No. 598,259

Int. Cl.[4] E06B *3/34*; E05D *11/04*

U.S. Cl. 109—73 **19 Claims**



1. A concealed hinge for use with a lightweight safe having a door, said hinge comprising:

a bearing means;

a pin member positioned slidably on top of said bearing means so as to ride thereon, the central longitudinal axis of said pin member defining a pivotal axis for said hinge;

a mounting bracket adapted to be mountable on the interior of said safe, said bracket possessing a cavity and a first access opening and a second access opening which communicate with said cavity, said second access opening being dimensioned and positioned to permit a sliding insertion and sliding retraction therethrough of said pin member and said bearing means, said cavity slidably receiving and rotatively embracing, said bearing means and a portion of said pin member whereby said pin-like member is free to rotate about said pivot axis and within said cavity, independently of said mounting bracket; said pin member extending through said first access opening;

sealing means for manually sealing and unsealing said second access opening, said sealing means including:

an axially threaded female socket configured within said second access opening, and

an axially threaded male connector plug dimensioned to interact with said female socket to form a manually releasable and adjustable seal for said second access opening;

wherein upon said plug being removed from said socket, said bearing means and said pin member are discharged from said hinge through said second access opening by the force of gravity;

a second retaining means which slidably receives and rotatively embraces a portion of said pin member; wherein said pin member is free to rotate about said pivotal axis independently of said mounting bracket; and

a leaf member generally shaped in an approximately "J"-shape cross-section, said leaf member being securely mounted on said second retaining means, said mounting permitting said leaf member to pivot around the pivotal axis of said hinge.

4,704,971

PULVERIZED-COAL BURNER

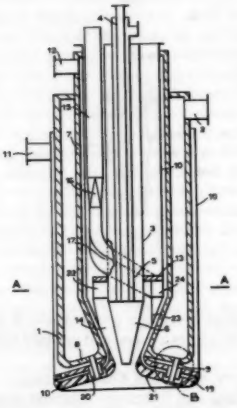
Klaus Fleischer; Peter Göhler; Rolf Mangler; Christian Reuther; Manfred Schingnitz, all of Freiberg; Friedrich Berger, Brand-Erbisdorf, all of German Democratic Rep.; Ernest Gudymov, Moskau, U.S.S.R.; Vladimir Semenov, Moskau, U.S.S.R.; Vasilij Fedotov, Moskau, U.S.S.R., and Boris Rodionov, Moskau, U.S.S.R., assignors to Brennstoffinstitut Freiberg, Freiberg, German Democratic Rep.

Continuation of Ser. No. 875,319, Jun. 16, 1986, abandoned. This application Dec. 5, 1986, Ser. No. 938,727

Claims priority, application German Democratic Rep., Nov. 12, 1985, 2827484

Int. Cl.[4] F23D *1/02*

U.S. Cl. 110—264 **7 Claims**



1. A pulverized-coal burner comprising

a housing (1) with an inlet pipe connection (2) for the supply of a mixture of steam and an oxidizing agent;

a central tube (3) with a duct (4) for supplying a fuel gas, a duct (5) for supplying an oxidizing agent, and a combustion chamber (6) arranged at the lower end of said central tube with said duct opening into said combustion chamber;

a pipe section (7) arranged between the housing (1) and the central tube (3) thereby forming annular chambers;

a pulverized-coal feeding device provided in the annular chamber between the central tube (3) and said pipe section (7);

a transverse partition provided between the central tube (3) and the pipe section (7) which forms a swirl chamber (14) opening at the bottom, into which the pulverized-coal feeding device extends;

a bottom plate (8) closing the annular chamber between the pipe section (7) and the housing (1);

a water-cooled jacket (10) enclosing the housing (1), the bottom plate (8) and the pipe section (7); and

a great number of discharge nozzles (9) for the supply of a mixture of steam and an oxidizing agent, these nozzles being provided in said bottom plate (8), passing through the water-cooled jacket (10) and opening to the outside;

and characterized in that an annular plate (18) is provided between the plate (8) and the water-cooled jacket (10), this plate having openings corresponding to the discharge nozzles (9), one edge of this annular plate (18) being fixed to the bottom plate (8) and the other edge, to the jacket (10); that the openings in said plate (18) are provided with sleeves (19) arranged coaxially with the corresponding discharge nozzles (9) in such a way that annular clearances are formed between said discharge nozzles (9) and said sleeves (19), said sleeves (19) extending into cup-shaped recesses (20) provided coaxially in the surface of the water-cooled jacket (10) thereby forming clearances as well.

4,704,972

METHOD AND APPARATUS FOR REDUCING ACID POLLUTANTS IN SMOKE

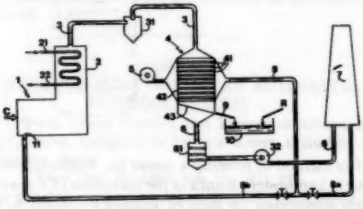
Denis Marchand, Le Pecq, France, assignor to Societe dite: SOGEA, Rueil Malmaison, France

Filed Jan. 13, 1987, Ser. No. 3,340

Claims priority, application France, Jan. 14, 1986, 86 00533

Int. Cl.[4] F23J *11/00, 15/00*

U.S. Cl. 110—345 **9 Claims**



1. A method for reducing the amount of water-soluble acid pollutants contained in hot smoke produced by combustion means (1; 101), comprising the steps of:

(a) removing dust from said smoke (31; 110),

(b) cooling the smoke to a temperature below a dew point thereof so that water vapor contained therein condenses and traps acid pollutants, said smoke being cooled by passing it through a heat exchanger (4) in thermal communication with a cold fluid in a descending vertical path,

(c) collecting and draining off the condensate (43, 9) for neutralization of the acid pollutants trapped therein with a reagent (10, R),

(d) passing smoke exiting the heat exchanger through means (61) for trapping remaining condensate droplets carried by the smoke, and

(e) releasing smoke exiting the trapping means to the atmosphere (7).

4,704,973

BOOKBINDING METHOD AND APPARATUS

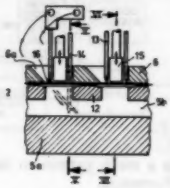
Rathert Horst, Minden, Fed. Rep. of Germany, assignor to Kolbus GmbH & Co. KG, Rahden, Fed. Rep. of Germany

Filed Jul. 14, 1986, Ser. No. 884,953

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1985, 3525185

Int. Cl.[4] B42B *2/04*

U.S. Cl. 112—21 **21 Claims**



1. In a sewing-press for thread-sewing book blocks which are formed from individual book block sections, the sewing-press including a sewing head and a sewing saddle, the sewing saddle feeding individual book block sections to the operating area of the sewing head, the sewing-press further including a delivery table for discharging the sewn book blocks, the sewing-press sewing head having at least a first hook needle and an associated sewing needle, the sewing needle punching an aperture through the fold of each individual book block section during the time the block section is in the said sewing head operating area, the thread being carried through the aperture by the sewing needle and thereafter being transferred to the hook needle, the hook needle also being punched through the fold of each individual book block section at a distance from the sewing needle in the said sewing head operating area, the hook needle leading the thread which has been carried through the aperture formed by the sewing needle out of the block section in the form of a loop and linking the loop to a thread loop previously formed on a next preceeding block section whereby the sewing head produces chain stitches which link the individual book block sections, the improvement comprising an endless conveyor which defines a path, drive means for imparting motion to said conveyor, a plurality of sewing saddles, articulated support means for individually suspending the sewing saddles from said conveyor, the sewing saddles being spaced from one another and being moveable from a starting position to a position for acquiring the individual book block sections and thence to a position within the operating area of the sewing head, the sewing saddles subsequently being moved back into the starting position.

4,704,974

AUTOMATIC SEWING MACHINE SYSTEM

Donald F. Herdeg, So. Hamilton, Mass., and Bruce A. Poirier, Windham, N.H., assignors to USM Corp., Flemington, N.J.

Filed Aug. 25, 1986, Ser. No. 900,022

Int. Cl.[4] D05B *21/00*

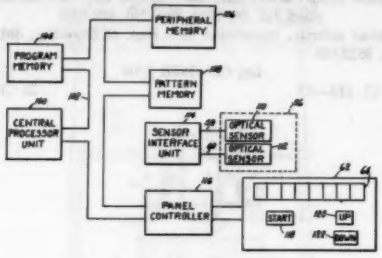
U.S. Cl. 112—121.12 **31 Claims**

1. A sewing machine wherein stitch patterns are automatically sewn on workpieces prearranged within pallets having associated pallet codes, said machine including a system for selectively assigning the stitch patterns to the pallet codes comprising:

means for sensing the pallet codes associated with the pallets;

means, responsive to a particular pallet code having been sensed by said sensing means, for displaying size informa-

tion relative to stitch patterns stored within the system; and



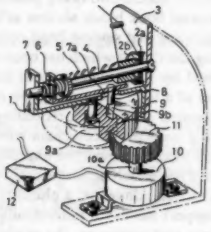
means for selecting a stitch pattern to be sewn from the displayed size information.

4,704,975

UPPER AND LOWER THREAD TENSION DEVICES FOR SEWING MACHINE

Kazumasa Hara; Akiyoshi Sasano, both of Tokyo, and Mikio Koike, Oume, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed May 20, 1986, Ser. No. 865,550
Claims priority, application Japan, May 23, 1985, 109379
Int. Cl.[4] D05B *63/00, 47/02*
U.S. Cl. 112—238 **5 Claims**



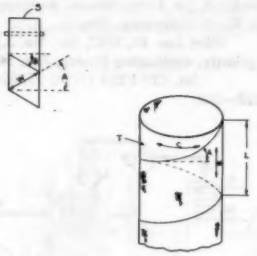
1. A device for adjusting upper and lower thread tension is sewing machines having an upper thread tension device with at least two disks receiving an upper thread therebetween, a spring for pressing the disks one against the other, and manually operated means including a dial operated in one direction in a maximum tension adjusting range to actuate the spring to progresively increase pressure to said disks until a maximum tension is applied to the upper thread and in another direction opposite to said one direction in the maximum tension adjusting range to actuate the spring to progressively decrease the pressure to the disks until a minimum tension is applied to the upper thread; a loop taker carrying a bobbin for a lower thread and rotated to catch a loop of the upper thread to connect the loop with the lower thread, and a feed dog having an engaging element engaging the lower thread extended between the bobbin and a fabric being sewn, the engaging element biasing the lower thread in one direction each time the feed dog is operated, to thereby draw out a predetermined amount of the lower thread from the bobbin, the upper and lower thread tension regulating device comprising electric means (**10, 12**) operatively connected to said dial and being set to be selectively responsive to the operation of said dial so as to produce a switching signal in response to said one direction and another direction, respectively; electromagnet means (**14**) having an actuator and being responsive to said switching signal to move said actuator in one direction in response to rotating said dial in said one direction, or to move said actuator in an opposite direction when said dial is rotated in said another direction; and actuating means including a lever having one end operatively connected to said actuator of said electromagnet means, said lever being so formed as to normally bias the lower thread toward a predetermined position spaced from said engaging element of said feed dog when said actuator of said electromagnet means is moved in said one direction, and to release the lower thread from said predetermined position spaced from said engaging element of said feed dog when said actuator of said electromagnet means is moved in said opposite direction.

4,704,976

METHOD AND APPARATUS FOR FORMING AND PRESENTING BIAS CUT GUSSETS IN THE FORMATION OF PANTY HOSE GARMENTS

J. Reid London, Winston-Salem; Cecil R. Bell, Jr., Pinnacle; A. Russell Edwards, Winston-Salem; Willie M. Lathery, Germanton; Lee A. Efird, Kernersville, all of N.C.; Richard M. Porter, Hartsville, S.C.; Stephen K. Shaw, Winston-Salem, N.C.; Thomas J. Costello, Kernersville, N.C.; August A. Pike, Winston-Salem, N.C.; Donald G. Bell, Mocksville, N.C., and Harold Setliff, High Point, N.C., assignors to Sara Lee Corporation, Winston-Salem, N.C.

Division of Ser. No. 838,314, Mar. 10, 1986, Pat. No. 4,640,162.
This application Oct. 27, 1986, Ser. No. 923,584
Int. Cl.[4] D05B *21/00, 1/00;* **A41B** *11/04;* **B21D** *43/00*
U.S. Cl. 112—262.2 **9 Claims**



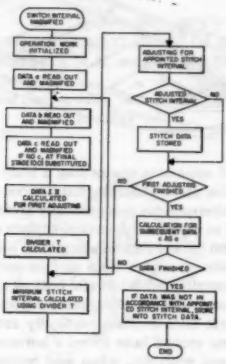
1. The method of forming a gusset for combining with two circularly knit hosiery blanks in the formation of a lower body garment comprising the steps of: knitting a continuous tube of seamless fabric, severing the fabric in a prescribed manner to define a bias cut continuous fabric strip of a prescribed width, advancing a prescribed length of the fabric strip to a shear, and severing the strip at a preselected angle to define a diamond-shaped gusset having the wales of the fabric running parallel to a line extending from one point of the diamond shape to the diagonally opposite point.

7. The method of forming a diamond-shaped gusset for subsequent sewing to knit hosiery blanks in the production of a panty hose garment comprising the steps of: cutting a circular knit tube of fabric to define a narrow strip of fabric having a width corresponding to the desired width of a gusset and with the wales of the fabric extending at a first preselected angle with respect to the length of the fabric strip, and severing the strip at a second preselected angle to define a diamond-shaped gusset with the fabric wales running parallel to a line extending from one point of the diamond shape to the diagonally opposite point.

4,704,977
METHOD AND APPARATUS FOR PREPARING SEWING DATA

Masanori Nukushina, Chofu, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1986, Ser. No. 890,348
Int. Cl.[4] D05B *3/02*
U.S. Cl. 112—266.1 **1 Claim**


SWITCH INTERVAL MAGNIFIED
OPERATION WORK INITIALIZED
DATA a READ OUT AND MAGNIFIED
DATA b READ OUT AND MAGNIFIED
DATA c READ OUT AND MAGNIFIED IF NO c, AT FINAL STAGE 0 IS SUBSTITUTED
DATA E IS CALCULATED FOR FIRST ADJUSTING
DIVIDER T CALCULATED
MINIMUM STITCH INTERVAL CALCULATED USING DIVIDER T
ADJUSTING FOR APPOINTED STITCH INTERVAL
ADJUSTED STITCH INTERVAL
NO
YES
STITCH DATA STORED
FIRST ADJUSTING FINISHES
NO
YES
CALCULATION FOR SUBSEQUENT DATA c AS e
DATA FINISHES
NO
YES
IF DATA WAS NOT IN ACCORDANCE WITH APPOINTED STITCH INTERVAL, STORE INTO STITCH DATA
END

1. In an automatic sewing apparatus which utilizes stored stitch data to embroider a zig-zag chain stitch on cloth while moving one or both of a cloth retainer and a sewing machine body relative to each other and which calculates each subsequent stitch position based on the previous stitch position, a method of preparing stitch data comprising the steps of:

(a) reading out three basic stitch data items as one process unit;

(b) multiplying each of said basic stitch data items by a magnification factor;

(c) adjusting each of said multiplied stitch data items to divide the stitch pattern into minimum stitch intervals; and

(d) summing each of said adjusted stitch data items corresponding to the multiplied stitch data of the selected stitch interval.

4,704,978
SEWING MACHINE HAVING AN AUTOMATIC CONTROL SYSTEM

Etsuzo Nomura; Tetsuo Kozawa, and Yasuo Sakakibara, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 21, 1986, Ser. No. 921,297
Claims priority, application Japan, Oct. 28, 1985, 60-241202
Int. Cl.[4] D05B *69/22*
U.S. Cl. 112—275 **9 Claims**

1. A sewing machine having an automatic control system comprising

a stitch forming means including a needle reciprocating across a material disposed on a material supporting surface;

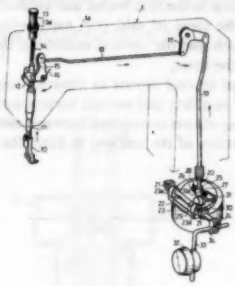
a material feeding means including a feed dog capable of making horizontal and vertical motions in synchronism with the reciprocation of said needle and a presser foot cooperating with said feed dog, said presser foot being movable between a lower position at which it presses said material to said feed dog and an upper position at which it is apart from said feed dog;

an urging means for applying a pressure to said presser foot;

an actuating means for substantially releasing the pressure against the material by the presser foot;

a storage means for storing predetermined data for forming a desired stitch length;

a first control means possessed of a plurality of modes for controlling said stitch forming means and material feeding means, said first control means having an automatic mode for forming stitches in accordance with said data and an ordinary mode for forming stitches independently of said data;



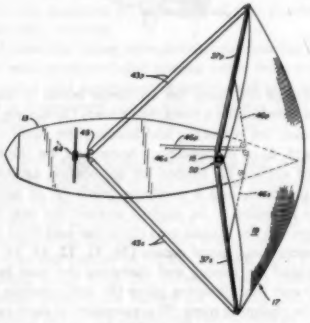
an interruption signal generating means for generating an interruption signal during a sewing process in each of said sewing modes;

and a second control means for setting said first control means in said ordinary mode and controlling said actuating means upon generation of said interruption signal during a process in said automatic mode.

4,704,979
SAIL SYSTEM

Mark E. Ammen, 1204 Lattie La., Mill Valley, Calif. 94941, and William D. Hansen, 1906 Vine St., Berkeley, Calif. 94709

Filed Nov. 26, 1985, Ser. No. 801,942
Int. Cl.[4] B63H *9/04*
U.S. Cl. 114—98 **9 Claims**



1. An improved sail system for a sailboat comprising:

(a) an upstanding mast that is non-rotatably mounted to the sailboat and tapers from the mounted end to a narrow masthead;

(b) first and second booms pivotably secured at a lower portion of the mast to have at least two degrees of pivotal freedom;

(c) a single sail suspended from said masthead, the sail having a shape such that, with the vertical midline of the sail positioned along the mast, forms a sail portion on the port side of the sailboat and a second, symmetrical, sail portion on the starboard side, with both said starboard and port sail portions having substantial roach areas and luff curvatures;

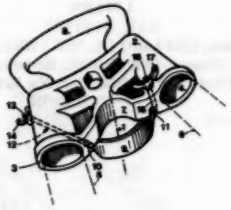
(d) a plurality of battens mounted at spaced-apart locations in said starboard and port sail portions to extend substantially toward the mast, and means to place the battens under compression such that said luff areas of the starboard and port sail portions each maintain a curved shape;
(e) first outhaul means to attach the clew of said starboard sail portion to the first boom, and second outhaul means to attach the clew of said port sail portion to the second boom such that the vertical midline of the sail can be held against the mast;
(f) first and second means to control, respectively, movement of said first and second booms; and
(g) backstay means connected between said masthead and a stern portion of the sailboat to bend the masthead aft.

4,704,980

DEVICE FOR FIXING THE WISHBONE BOOM TO THE MAST OF A SAILBOARD

Manuel Fontannaz, CH-1845 Noville, Switzerland

Filed Nov. 12, 1986, Ser. No. 929,443
Claims priority, application Switzerland, Nov. 22, 1985, 4987/85
Int. Cl.[4] B63H *9/10*
U.S. Cl. 114—98 **6 Claims**



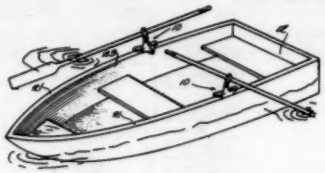
1. A device for fixing the wishbone boom to the mast of a sailboard, comprising a front fixing body (2) having, on the one hand, means for receiving and holding the two front ends of the arms (5, 6) of the wishbone boom and, on the other hand, an arched surface (7) shaped for application against the front part of the mast, and a clamping piece (9) of arched shape, which is intended to be applied against the rear part of the mast, opposite the arched part (7) of the said front fixing body (2), wherein mechanical means (10, 11, 12, 13, 14, 15, 16, 17) are provided for joining and clamping the mast between this body (2) and this clamping piece (9), and wherein the arched part of the clamping piece (9) is extended, at each end, by a rod (10, 11) which is threaded (13, 16) at its free end, these threaded rods being intended to pass through channels made in the front fixing body (2), and nuts (14, 17), which can be turned by hand, being intended to cooperate with the threaded part (13, 16) projecting beyond these channels, on the one hand to simply fit the device to the mast with the freedom to slide it along the mast, before the sailboard is put in the water, and on the other hand to enable the user on the sailboard to bring the device to the height which suits him and to lock the device on the mast, at this height, by fully tightening the said nuts (14, 17), which then bear against the said body (2), or, conversely, to enable the user to change the height of the device while sailing, by partially loosening the nut (14) and then adjusting the height of the device and locking the device on the mast by fully tightening the nut (14).

4,704,981

COMBINATION CLEAT AND OARWELL

Hugh R. Agner, 30834 Jennie La., Burlington, Wis. 53105

Filed Jul. 18, 1986, Ser. No. 886,623
Int. Cl.[4] B63B *21/04*
U.S. Cl. 114—218 **8 Claims**



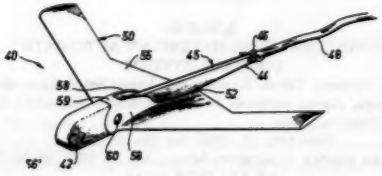
1. An oarwell apparatus comprising a body portion including opposite sides and a generally flat bottom surface adapted to be attached alternatively to a generally horizontal surface of a boat hull and to a generally vertical surface of the boat hull, said body portion having therein a first bore with an axis generally perpendicular to said bottom surface and a second bore with an axis generally parallel to said bottom surface, whereby when said bottom surface is attached to a generally horizontal surface, said first bore forms a vertically extending oarwell aperture and said second bore forms a horizontally extending side aperture, and whereby, when said bottom surface is attached to a generally vertical surface, said second bore forms a vertically extending oarwell aperture and said first bore forms a horizontally extending side aperture.

4,704,982

ANCHOR ARRANGED FOR LOWERING ALONG AN INCLINED PLANE

Agge Sahlberg, Dammtrapgatan 34, S-121 63 Johanneshov, Sweden

Filed Apr. 11, 1986, Ser. No. 851,030
Claims priority, application Sweden, May 3, 1985, 8502187
Int. Cl.[4] B63B *21/24*
U.S. Cl. 114—304 **12 Claims**



1. A boat and vessel anchor so arranged as to find a hold on the bottom, at a point at a considerable horizontal distance from the point at which the boat or the vessel drops the anchor, by gliding front end first through the water along an inclined plane, the anchor comprising a central, elongated shank arranged for the attachment of an anchor rope or the like, a wing comprising a pair of transverse arms attached to the front part of the shank and extending outwards each from its own side of the shank in generally symmetrical relation to it, each arm being platelike and shaped to comprise half of a wing, the plane of each arm extending substantially parallel to the anchor shank, the wing-shaped arms of the anchor being securely attached to one another or made in one piece so that the wing is continuous, a central portion of the wing extending rearwards and tapering to a point, means pivotally connecting the wing as a whole with the shank for (1) providing lift when adjacent the shank and, once the anchor has reached the bottom and a pull is applied to the anchor rope, for (2) pivoting

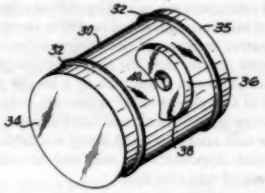
away from said shank and digging into the bottom with its central, tapering portion, the latter of which constitutes a pivotable anchor fluke.

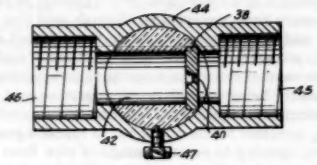
4,704,983

FLOW METERING SIGHT GLASS

Robert Rung, Hopatcong, N.J., assignor to Victaulic Company of America, Easton, Pa.

Filed Sep. 4, 1985, Ser. No. 772,871
Int. Cl.[4] G01F 23/02
U.S. Cl. 116—276 13 Claims





1. A flow metering and flow indicating sight glass for use in a plumbing fixture having an open-ended bore extending completely therethrough, and with which input and outlet passages communicate at positions intermediate the axial ends of said bore, said sight glass including:

a solid cylinder of transparent glass-like material receivable within said bore in sealed relation therewith;

said solid cylinder having axially opposed end faces extending transversely of the longitudinal axis of said cylinder, at least one of said end faces providing a viewing face through which the interior of said solid cylinder can be viewed;

a metering passage providing a metering orifice formed within said solid cylinder and for communication with said inlet passage of said fitting; and

a cavitation chamber formed directly within said solid cylinder and into which said metering passage discharges, said cavitation chamber being formed for communication with said outlet passage of said fitting;

said metering passage and said cavitation chamber being arranged in series relationship, and extending through the body of said solid cylinder transversely to the longitudinal axis thereof;

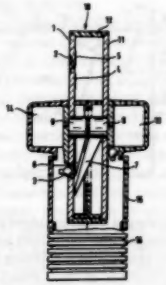
whereby the presence of fluid exiting said metering passage can be visually confirmed by inspection through said viewing face, and, the presence of actual flow-through said metering passage can be visually confirmed by inspection through said viewing face of cavitation occuring in said cavitation chamber of fluid exiting said metering passage.

4,704,984

DISPLAY DEVICE

Klaus Mayer, Obertshausen, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt/Main, Fed. Rep. of Germany

Filed Feb. 14, 1986, Ser. No. 829,683
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1985, 3505735
Int. Cl.[4] G01D 11/28, 13/22
U.S. Cl. 116—287 12 Claims



1. In a display device for displaying two measured values on a graduated dial which is provided with two scales arranged concentrically to each other, the display device including two pointers which are turnable by coaxial pointer shafts, each pointer being coordinated to a separate one of the scales, and each pointer being driven in rotation by a separate measurement mechanism, the improvement comprising:

a housing,

said measurement mechanisms are arranged in said housing coaxially to each other on opposite sides of the graduated dial, and

said pointer shafts have ends which face each other, said pointers are mounted on said ends of said pointer shafts, respectively, wherein

said graduated dial being mounted in said housing at a portion of said graduated dial spaced away from said scales and leaving said scales unobstructed, and said graduated dial is a transparent plate which enables light to pass therethrough from a side thereof facing away from a viewer, and

said scales are opaque scales arranged on said plate, and

said housing is configured so as to leave the graduated dial in the region of the scales free on said side facing away from the viewer so as to provide an unobstructed path for illumination from said side of said transparent plate facing away from the viewer to permit ambient light from said side facing away from the viewer to pass through said transparent plate to the viewer for viewing said scales.

9. In a display device for displaying two measured values on a graduated dial which is provided with two scales arranged concentrically to each other, the display device including two pointers which are turnable by coaxial pointer shafts, each pointer being coordinated to a separate one of the scales, and each pointer being driven in rotation by a separate measurement mechanism, the improvement wherein

said measurement mechanisms are arranged coaxially to each other on opposite sides of the graduated dial, and

said pointer shafts have ends which face each other, said pointers are mounted on said ends of said pointer shafts, respectively, and wherein

said display device further comprises

a housing which extends through the graduated dial within a region of the graduated dial away from the two scales, and wherein

the two measurement mechanisms are arranged in said housing.

4,704,985

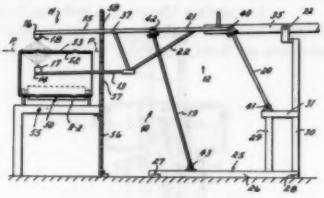
SPRAY GUN MOVER

Mordecai Rubinstein, Richon Le Zion, Israel, assignor to Nordson Corporation, Westlake, Ohio

Filed May 30, 1986, Ser. No. 868,934

Int. Cl.[4] B05B *13/06*

U.S. Cl. 118—316 **4 Claims**



2. Apparatus for moving a coating apparatus in a predetermined, substantially straight line path from an exterior position to a position within the interior of a rotating cylindrical object for coating an interior surface of that object, and including:

a movable lance means having a distal end for mounting a coating apparatus for operative movement thereof in said substantially straight line path;

at least one straight rear strut supporting said lance means, said straight rear strut being pivoted to said lance means at a first pivot and to a stationary support at a second pivot;

at least one straight forward strut supporting said lance means, said straight forward strut being pivoted to said lance means at a third pivot and to a stationary support at a fourth pivot;

said second and fourth pivots being stationary;

said first and third pivots moving through first and second arcs of varying radius during motion of said lance means to generate movement of said distal end of said lance means in a substantially straight line to maintain motion of said coating apparatus in said straight line path, and

wherein the length of said rear strut and the radius of said first arc are shorter than the respective lengths of said forward strut and of the raduis of said second arc.

4,704,986

PIPE CLEANING OR TREATING PLANT

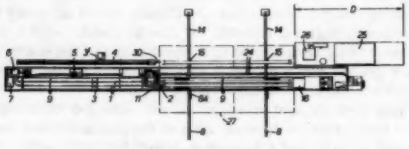
Stephen E. Remp, Inverurie; Rodger M. H. Ewen, Stonehaven, and Norman S. Cumming, Aberdeen, all of Scotland, assignors to Ramco Oil Services, Great Britain

Continuation of Ser. No. 633,794, Jul. 24, 1984, abandoned. This application Jul. 28, 1986, Ser. No. 889,607

Claims priority, application United Kingdom, Jul. 27, 1983, 8320292

Int. Cl.[4] B05B *13/06*

U.S. Cl. 118—318 **12 Claims**



1. A self contained, mobile plant for cleaning or treating the inside of pipe, said plant comprising

a plurality of standard I.S.O. shipping containers having a length between oppossed ends and sidewalls therebetween that cooperate to constitute a mobile and self-contained plant, said containers being adapted for end to end disposition in an operative arrangement with one another on site during use as a plant but being separate one from the other during transport from one use site to another, each container containing at least one item for cleaning or treating the inside surface of pipe, said items comprising an entry rack for receiving pipe to be cleaned or treated, a first carriage for supporting pipe upon receipt from said entry rack, an elongated lance, a spray device fixed to said lance, a second carriage to support said lance, a conveyor for feeding cleaning or treating material to said spray device, a drive connected with at least one of said carriage for moving pipe relative to said lance while said spray device cleans or treats the inside surface of said pipe, and an exit rack for receiving the cleaned or treated pipe,

rails mounted in at least two of said containers and extending generally para[1]lel the sidewalls of said two containers, said rails of said two containers cooperating with one another when said containers are in said operative arrangement, at least one of said carriages being movable along said rails to permit relative movement between said lance and pipe over a length greater than the length of a single container so that said plant can clean pipe of a length greater than the length of a single container when said containers are in said operative arrangement, said entry and exit racks being storable in said containers and being erectable in substantially normal disposition to said end to end operative arrangement of said container,

at least a first said sidewall on at least one of said operative arrangement of said containers being hinged to its respective said shipping container at an upper edge thereof, said first sidewall being openable for its full depth to reveal a portion of a first opening to permit passage of pipe along said entry rack transversely through said first opening onto said first carriage when said first sidewall is opened

at least a second said sidewall on at least one of said containers on another side of said operative arrangement of said containers being hinged to its respective said shipping container at an upper edge thereof, said second sidewall being openable for its full depth to reveal a portion of a second opening to permit passage of pipe from said first carriage on to said exit rack in a direction transverse to said second opening when said second sidewalls are opened, both said openings permitting passage to and from said first carriage of pipe of a length greater than the length of a single said container,

said sidewalls being adapted to provide protective roofs over said entry and exit racks when said first and second sideswalls are opened and said entry and exit racks are erected, and said first and second sidewalls being closed during transport of said plant from one use site to another, and

cable support means for supporting the roofs of the containers defining said opening portions, whereby said openings are adapted to permit passage therethrough of pipe of a length greater than the length of a single container.

4,704,987

PAINTING MASK AND FIXTURE

Edward W. Curtze, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Mar. 27, 1986, Ser. No. 844,578

Int. Cl.[4] B05C *13/00, 13/02*

U.S. Cl. 118—500 **13 Claims**

1. A fixture for masking and supporting a window assembly, the window assembly including a sheet of glass and at least one gasket formed on a periphery thereof, the fixture comprising:

a first cover having a floor and attached walls, said walls including a recessed portion;

a second cover having a floor; and

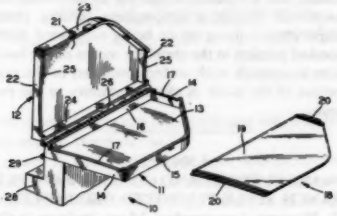
hinge means for pivotly connecting said first and second covers for movement between an open position in which said covers are spaced apart to accept a window assembly

and a closed position in which said covers are in contact to support and mask a glass sheet of a window assembly, the window extending through said recessed portion to expose a gasket formed on the glass sheet, said recessed portion of said walls sealingly engaging the window assembly.

10. A fixture for masking and supporting an article of manufacture comprising:

a first cover having a generally planar floor, a generally upstanding wall extending from a periphery of said floor, and a recessed portion formed in said wall for accepting an article;

a second generally planar cover;



first hinge means pivotally connecting said first and second covers for movement between an open position in which an article can be inserted between said first and second covers and a closed position in which an article can be retained between said first and second covers, whereby said covers mask a first portion of an article and said recessed portion and said second cover form an aperture through which the article extends to expose a second portion thereof to a manufacturing operation; and

second hinge means connected between one of said first and second covers and a mounting surface for movement of said covers between first and second manufacturing operation positions.

4,704,988

PROCESS AND APPARATUS FOR OBTAINING A GASEOUS STREAM CONTAINING A COMPOUND IN THE VAPOR STATE, MORE PARTICULARLY USABLE FOR INTRODUCING THIS COMPOUND INTO AN EPITAXY REACTOR

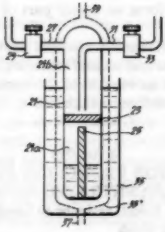
Robert Mellet, 18 Rue Chapon, 75003 Paris, France

Filed Aug. 5, 1985, Ser. No. 762,707

Claims priority, application France, Aug. 14, 1984, 84 12788

Int. Cl.[4] C23C *16/00*

U.S. Cl. 118—726 **10 Claims**



1. A process for providing a gaseous stream containing a compound in the vapour state, comprising the steps of:

(a) introducing a compound to be provided in the vapour state in a gaseous stream into a first compartment of an enclosure which is separated from a second compartment by a porous partition and containing said compound in said first compartment to prevent passage of compound except in its vapour state through said porous partition.

(b) heating said compound in said first compartment to a predetermined temperature to provide compound in the vapour state and diffusing the compound in the vapour state in said first compartment through said porous portion into said second compartment,

(c) circulating in the second compartment a carrier gas able to entrain the compound in the vapour state, and

(d) extracting from the second compartment the carrier gas containing diffused compound in the vapour state to provide said gaseous stream.

5. An apparatus for providing a gaseous stream containing a compound in the vapour state comprising an enclosure subdivided into first and second compartments by a porous partition, the first compartment being adapted to contain said compound in the liquid state remote from said porous partition and to prevent passage of said compound except in the vapour state through said porous partition, a porous element adapted to be charged by capillarity with said compound in the liquid state in said first compartment and to deliver said compound in the liquid state to a location in said first compartment spaced from said porous partition, means for heating said compound to convert it from the liquid state to the vapour state within said first compartment for diffusion of said compound in the vapour state through said porous partition into said second compartment, and means for circulating in the second compartment a carrier gas able to entrain the diffused compound in the vapour state to provide said gaseous stream.

4,704,989

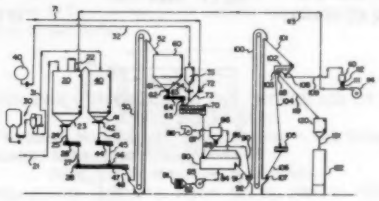
CAT BOX LITTER AND PROCESS FOR PRODUCING SAME

John Rosenfeld, 500 Keele Street, Toronto, Ontario, Canada M6N 3C9

Continuation-in-part of Ser. No. 680,527, Dec. 11, 1984. This application Dec. 30, 1985, Ser. No. 814,622

Int. Cl.[4] A01K *1/015*

U.S. Cl. 119—1 **15 Claims**

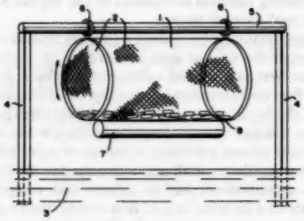


1. A process for making absorptive pellets from clay "fines" having open pore spaces therein, said fines including particles of about 40–200 mesh, said process comprising:

(a) forming a mixture of said clay "fines" with an aqueous solution of an adhesive-type, lignin-type binder, to provide such mixture with a moisture content of about 46% by weight; and

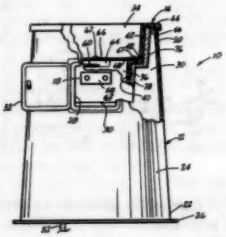
(b) subjecting said mixture of moistened clay-adhesives-type, lignin-type binder particles to the action of a pin-type solids conditioning and micropelletizing processor, thereby converting said moistened clay-binder particles into partially-dried multi-faceted, bulky aggregates by the action of a low-speed rotor shaft-and-pin assembly in said pin-type processor while substantially simultaneously flashing-off some of the excess moisture to provide partially-dried durable, bulky, highly absorptive pellets having a maximum of about 25–29% by weight moisture; said pellets having surface absorptive capacity as well as having an absorptive capacity in said open pore spaces approaching the capacity of said clay "fines" starting material.

4,704,990
CULTIVATING MOLLUSCS
Wayne R. Moxham, 23 Brooklyn Road, Brooklyn, New South Wales 2253, Australia
Filed Jan. 23, 1986, Ser. No. 824,345
Claims priority, application Australia, Jan. 30, 1985, PG9075
Int. Cl.[4] A01K 61/00
U.S. Cl. 119—4 18 Claims



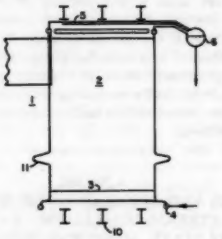
1. Apparatus for growing molluscs, comprising:
a water-permeable container for holding a number of molluscs for cultivation in mollusc-feeding water;
means for attaching said container to supports so the container is rotatably supported in the mollusc-feeding water; and
means responsive to regular movement of the mollusc-feeding water to give the container a rotational movement to thereby regularly tumble the molluscs in the container.

4,704,991
LIVESTOCK WATERING SYSTEM
James G. Moore, Norman, Okla., assignor to F.R.P. Industires, Inc., Norman, Okla.
Filed Sep. 19, 1985, Ser. No. 777,841
Int. Cl.[4] A01K 7/00
U.S. Cl. 119—73 13 Claims



1. A livestock watering system comprising:
a housing having an upper end portion, a lower end portion and a continuous sidewall;
a basin supported by the upper end portion of the housing, said basin having an upper drinking portion and lower reservoir portion;
partition means supported within the basin for separating the upper drinking portion from the lower reservoir portion, the partition means permitting the water to flow therethrough as same is circulated between the lower reservoir portion and the upper drinking portion in response to the differential of temperature of the water in the basin;
shoulder means formed at the junction of the upper drinking portion and the lower reservoir portion for supporting the partition means, the shoulder means having a recessed portion formed therein;
flow control means for maintaining a substantially constant level of water in the basin;
heating means disposed within the lower reservoir portion of the basin for selectively heating the water in the lower reservoir portion of the basin; and
temperature sensing means for sensing the temperature of the water in the basin, said temperature sensing means operably connected to the heating means for selectively activating the heater means between one of an on mode and an off mode in response to the temperature of the water in the basin so that water is circulated between the upper drinking portion and the lower reservoir portion in response to a differential of temperature of water in the upper drinking portion and the lower reservoir portion of the basin, said temperature sensing means comprising:
a thermostat having a temperature sensing probe, the temperature sensing probe being supported within the recessed portion in the shoulder means of the basin so as to be in contact with water contained in the reservoir portion of the basin in close proximity to the partition means.

4,704,992
WATERWALL SUPPORT AND CONFIGURATION FOR A RANCH STYLE FLUIDIZED BED BOILER
Richard E. Waryasz, Longmeadow, Mass., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Jun. 16, 1983, Ser. No. 505,139
Int. Cl.[4] F22B 1/00
U.S. Cl. 122—4 D 3 Claims



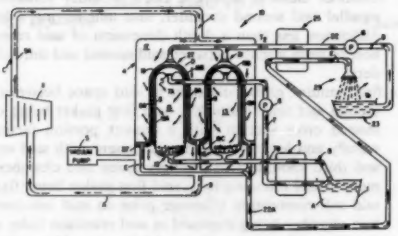
1. A utility type boiler having a waterwalled furnace fired by a ranch-type fluidized bed combustor, including.
a ground-level support structure for the bed,
a first section of waterwall extending vertically upward from the periphery of the bed in formation of the lower part of an enclosure for the freeboard volume above the bed,
a second section of waterwall extending downwardly from top support to form an upper part of the freeboard volume,
and a vertically flexible waterwall section as a transition between the first and second waterwall sections to accommodate vertical movement of the upper and lower waterwall sections relative to each other.

4,704,993
APPARATUS FOR PRODUCING POWER USING CONCENTRATED BRINE
Gad Assaf, Rehovot, Israel, assignor to Geophysical Engineering Company, Seattle, Wash.
Division of Ser. No. 719,870, Apr. 4, 1985, Pat. No. 4,617,800. This application Aug. 8, 1986, Ser. No. 894,902
Int. Cl.[4] F22B 1/20
U.S. Cl. 122—21 13 Claims

2. A condenser-evaporator comprising:
(a) a closed housing having an internal barrier for separating the housing into first and second chambers;

(b) said barrier defining a first vertically oriented surface in said one chamber and a second vertically oriented surface in the second chamber;

(c) means to add concentrated brine onto said first surface for forming a falling film of brine thereon whereby said



first chamber operates as a condenser when water vapor is introduced thereinto; and

(d) means to add liquid water onto said second surface of said barrier for forming a falling film of water thereon whereby said second chamber operates as a vaporizer.

4,704,994

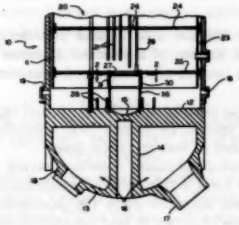
FLOW BOOSTING AND SLUDGE MANAGING SYSTEM FOR STEAM GENERATOR TUBE SHEET

Min-Hsiung Hu, Murrysville Boro, and Glen W. Hopkins, Forest Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 16, 1986, Ser. No. 852,875

Int. Cl.[4] F22B *1/16*

U.S. Cl. 122—32 **20 Claims**



1. In a heat exchanger including a pressure vessel closed at one end by a tube sheet and having a generally cylindrical side wall, a plurality of heat exchange tubes within the vessel extending into the tube sheet outside of a circular central region thereof and providing heat exchange between a primary fluid flowing therethrough and a secondary fluid flowing thereabout in a flow path extending generally radially inwardly along the tube sheet and axially upwardly along the tubes, a circularly cylindrical wrapper spaced inwardly from the side wall encompassing the plurality of tubes, and a baffle plate disposed above the tube sheet substantially parallel thereto, the improvement comprising: a circularly cylindrical flow boosting member disposed radially inwardly of the wrapper coaxially with the central region, and means supporting said member beneath the baffle plate and a predetermined distance above the tube sheet, said member serving to increase the radial flow velocity of the secondary fluid along the tube sheet before it enters the central region thereof.

4,704,995

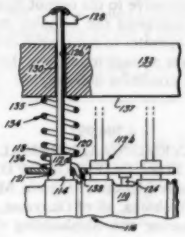
GUIDE FOR ROLLER CAM FOLLOWER

Raymond A. Soeters, Jr., West Bloomfield, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 669,694, Nov. 8, 1984, abandoned, which is a continuation of Ser. No. 384,698, Jun. 3, 1982, abandoned. This application Sep. 27, 1985, Ser. No. 894,289

Int. Cl.[4] F01L *1/14*

U.S. Cl. 123—90.5 **3 Claims**



1. In an internal combustion engine having a block, cylinder head and valve train with a plurality of roller cam followers slidably received in a bore in the engine block, and follower guide means, the improvement comprising:

(a) means defining a guide surface on each of said; followers

(b) a guide member received over a plurality of said followers and having cooperating surfaces therein slidably contacting said guide surface on each follower and operative to permit limited rotation thereof during slidable movement of said follower with respect to said guide means;

(c) a coil spring biasing said guide member against said block, said guide member being otherwise floating, said coil spring having one end thereof registering on portions of the engine cylinder head and the opposite end thereof contacting said guide member, the end contacting said guide member including an end portion engaging a cooperating surface on said guide member for preventing rotation of said spring.

4,704,996

SYSTEM FOR CONTROLLING THE INTAKE AIR OF AN AUTOMOTIVE ENGINE

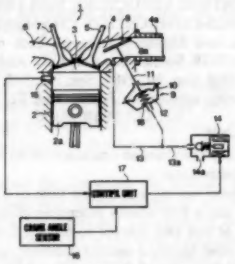
Koji Morikawa, Naritahigashi, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1986, Ser. No. 820,868

Claims priority, application Japan, Jan. 22, 1985, 60-10278

Int. Cl.[4] F02B *31/00*

U.S. Cl. 123—188 M **7 Claims**



1. A system for controlling intake air of an automotive engine, comprising:

a swirl intake passage inducing air into a combustion cham-

ber of the engine and disposed so as to swirl the air induced into the combustion chamber of the engine;

a deflector plate provided in the swirl intake passage so as to vary the cross-sectional area of the swirl intake passage to control swirl ratio;

actuator means for operating the deflector plate;

detecting means for detecting a combustion condition of the engine and for producing an output signal dependent on the combustion condition; and

control means responsive to the output signal for producing an output for operating the actuator means so that the deflector plate operates to reduce the cross-sectional area of the swirl intake passage to increase the swirl ratio when the combustion condition deteriorates.

4,704,997

DEVICE FOR PREVENTING ABNORMAL FLOW OF GAS FUEL FROM GAS FUEL INJECTOR OF DIESEL ENGINE

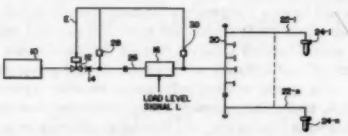
Yasuhisa Endo; Shuhei Mizuhara; Satoshi Murakami; Osamu Beppu, and Saiji Toshioka, all of Okayama, Japan, assignors to Mitsui Engineering and Shipbuilding Co. Ltd., Tokyo, Japan

Filed Jun. 24, 1986, Ser. No. 878,079

Claims priority, application Japan, Jun. 24, 1985, 60-95525[U]; Aug. 13, 1985, 60-178136; Aug. 16, 1985, 60-125550; Aug. 19, 1985, 60-181373; Dec. 27, 1985, 60-295772

Int. Cl.[4] F02B *77/00*

U.S. Cl. 123—198 DB **8 Claims**



1. A device for preventing abnormal flow of gas fuel from a gas fuel injector of a diesel engine comprising:

a pipe means for supplying a pressurized gas fuel;

a fuel injector means including a housing having a passage connected to said pipe means and leading to fuel injection nozzle ports, and a valve member having a piston portion and adapted to open and close said passage by the force produced by a control oil in accordance with the speed of said engine and the level of load on said engine; and

a fuel cut-off valve means having a valve member adapted to close a gas fuel passage constituted by said pipe means and said passage in said fuel injector means, in response to a reduction of the fuel pressure in said fuel passage.

4,704,998

MOUNTING STRUCTURE FOR CERAMIC SUB-COMBUSTION CHAMBERS

Takio Kojima, and Masato Taniguchi, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Aug. 20, 1985, Ser. No. 767,729

Claims priority, application Japan, Aug. 21, 1984, 59-126523

Int. Cl.[4] F02B *19/00*

U.S. Cl. 123—271 **3 Claims**

1. A subsidiary combustion chamber for an internal combustion engine comprising:

a cylinder head having a retention hole of a selected normal diameter and a first axially extending portion of increased diameter at one end thereof to form a first shoulder, said cylinder head having a second shoulder extending radially at the opposite end of said retention hole;

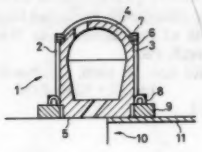
a heat shielding annular ring disposed in said first axially extending portion in engagement with said first shoulder, said ring having an outer diameter corresponding substantially to the diameter of said first axially extending portion and an inner diameter less than said normal diameter of said retention hole;

a ceramic sub-combustion chamber unit disposed in said retention hole, said unit including a mouthpiece element and a chamber element and having an outer diameter less than the normal diameter of said retention hole, said chamber element having a third shoulder substantially parallel said second shoulder, said unit having a length dimension less than a depth dimension of said retention hole to form a space between said second and third shoulders;

a first annular gasket disposed in said space between said second and third shoulders, said first gasket being of U-shaped cross section with a convex portion facing inwardly and leg portions in engagement with said second and third shoulders to sealingly space said chamber element in said retention hole, said first gasket being fixed to said sub-combustion chamber prior to said sub-combustion chamber being disposed in said retention hole; and

a second annular gasket disposed between said mouthpiece element and said retention hole, said gasket being of U-shaped cross section with a convex portion facing away from said heat shielding ring and leg portions in engagement with said retention hole, said heat shielding ring, and said mouthpiece element to sealingly space said mouthpiece element in said retention hole, said second gasket being fixed to said sub-combustion chamber prior to said sub-combustion chamber being disposed in said retention hole.

3. A method of providing a cylinder head with a subcombustion chamber comprising the steps of:



forming a retention hole in said cylinder head having a peripheral surface of a selected diameter and an axially extending portion of an increased diameter to form a first shoulder;

forming in the peripheral surface a second radially extending shoulder spaced from said first shoulder adjacent the opposite end of said retention hole;

forming a sub-combustion chamber having a portion positioned to form a third shoulder substantially parallel to said second shoulder upon the positioning of said sub-combustion chamber in said retention hole;

fixing a first annular U-shaped gasket having a convex portion and leg portions to said sub-combustion chamber positioned with the convex portion facing inwardly in engagement with the sub-combustion chamber and the leg portions facing outwardly;

fixing a second annular U-shaped gasket having a convex portion and leg portions to the sub-combustion chamber with the convex portion opposing the first gasket and the leg portions extending substantially perpendicular to the first gasket leg portions;

positioning the sub-combustion chamber in said retention hole with the leg portions of said first gasket engaging said second shoulder of said cylinder head and with said leg portions of said second gasket engaging the periphery of said retention hole to space said sub-combustion chamber from said cylinder head; and

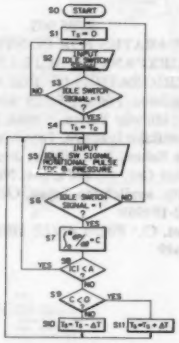
placing a sealing ring surrounding said retention hole in engagement with said leg portions of said second gasket to seal the space between said sub-combustion chamber and said cylinder head.

4,704,999

FUEL INJECTION CONTROL FOR DIESEL ENGINE

Atsushi Hashikawa, Okazaki; Nozomi Kitagawa, and Tetsuro Kikuchi, both of Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 3, 1986, Ser. No. 870,143
Claims priority, application Japan, Jun. 4, 1985, 60-119669
Int. Cl.[4] F02D *41/38*
U.S. Cl. 123—299 **7 Claims**


START
INPUT IDLE SWITCH SIGNAL
IDLE SWITCH SIGNAL = 1 ?
INPUT IDLE SW SIGNAL, ROTATIONAL PULSE, TDC & PRESSURE
IDLE SWITCH SIGNAL = 1 ?
YES
NO

1. A method for controlling fuel injection in a diesel engine having a fuel injection nozzle, comprising the steps of:

detecting an idling state of the diesel engine and pressure in a combustion chamber;

obtaining a pressure increment rate from the pressure detected by said detecting step;

selecting a valve opening pressure of said fuel injection nozzle at a relatively low level when the idling state is detected by said detecting step, thereby setting a two peaks characteristic of a fuel injection rate; and

controlling said fuel injection nozzle in response to the pressure increment rate so that the pressure increment rate in the combustion chamber is maintained within a predetermined value by changing a fuel injection quantity of a pilot injection from said fuel injection nozzle.

4,705,000

APPARATUS AND METHOD FOR CONTROLLING AMOUNT OF FUEL INJECTED INTO ENGINE CYLINDERS

Toshimi Matsumura, Aichi; Shinya Sumitani, Anjo; Takahiro Hayakawa, Kariya; Takashi Hasegawa, Tajimi, all of Japan, and Shuji Sakakibara, Palos Verdes, Calif., assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 8, 1985, Ser. No. 752,732
Claims priority, application Japan, Jul. 9, 1984, 59-141774
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—357 **4 Claims**

1. Apparatus for controlling the amount of fuel injected into a multi-cylinder internal combustion engine, comprising:

(a) means for detecting rotational speed of said engine at least two different angles of a crankshaft of said engine for producing two engine speed data NHi and NLi for each of the cylinders of said engine wherein "i" is a positive integer indicating cylinder number;

(b) means for detecting operational parameters of said engine including engine load;

(c) computing means;

for obtaining a difference $\Delta Ni = NHi - NLi$ between said two engine speed data measured for each of said cylinders;

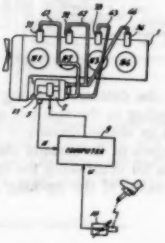
for obtaining an average difference ΔN using a plurality of difference values ΔNi computed for the respective cylinders;

for obtaining a further difference d^2Ni by substracting said differences ΔNi from said average difference ΔN respectively for all the cylinders;

for obtaining a correction integration factor ϵ using said further difference d^2Ni respectively for all the cylinders;

for correcting a correction factor Qi, which is provided for each cylinder for respectively correcting the amount of fuel to be supplied to the cylinders, using said correction integration factor ϵ respectively for all the cylinders;

for obtaining a sum total $S = \Sigma Qi$ of all of said correction factors Qi;



for checking whether said sum total S has a particular relationship with a predetermined value;

for incrementing or decrementing each of said correction factors Qi depending on the relationship of said sum total S and said predetermined value;

for obtaining basic fuel amount Io using engine speed data and engine load data;

for correcting said basic fuel amount Io by said correction factors Qi provided respectively for all the cylinders; and

for producing a control signal using corrected basic fuel amount; and

(d) means for controlling the amount of fuel injected into the engine cylinders in accordance with said control signal.

4,705,001

DEVICE FOR CONTROLLING ENGINE AND METHOD THEREOF

Yoshiaki Danno; Akira Takahashi, and Kazumasa Iida, all of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 711,477, Mar. 13, 1985, abandoned. This application Dec. 17, 1986, Ser. No. 5,299
Claims priority, application Japan, Mar. 15, 1984, 59-50326; Mar. 15, 1984, 59-50327
Int. Cl.[4] F02P *5/00*
U.S. Cl. 123—417 **15 Claims**

1. A device for controlling an internal combustion engine having an air intake passage and a throttle valve provided in said intake passage on the basis of the opening degree of said throttle valve, and air flow through said intake passage comprising:

an air flow sensor for detecting the amount of suction air flowing through said intake passage of the engine:

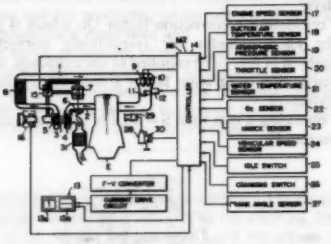
a throttle sensor for detecting the opening degree of said throttle valve provided in the intake passage;

calibration means for calibrating the opening degree of said throttle valve when the engine is running under predetermined operational conditions, said calibration means comprising:

a first means for estimating a theoretical opening degree of

the throttle valve from the amount of air flow of suction air sensed by said air flow sensor,

a second means for comparing said theoretical opening degree of the throttle valve estimated by said first means with the detected opening degree of the throttle valve detected by said throttle sensor, and a third means for



calibrating the detected opening degree of the throttle valve according to the result of comparison by said second means to obtain thereby a calibrated value of the opening degree of the throttle valve, and

control means for controlling the engine according to said calibrated value of the opening degree of said throttle valve.

4,705,002

ELECTRONIC AIR-FUEL MIXTURE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

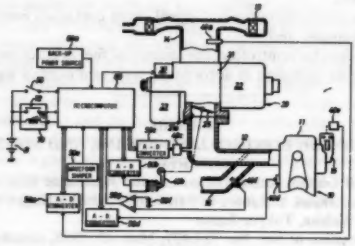
Tsuneo Ando; Kazusato Kasuya; Yukitoshi Asada, and Hironobu Sugimoto, all of Oobu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Oobu, Japan

Filed Mar. 31, 1986, Ser. No. 846,552

Claims priority, application Japan, Mar. 29, 1985, 60-67797

Int. Cl.[4] F02D *41/14*

U.S. Cl. 123—440 **5 Claims**



1. An electronic air-fuel mixture control system for an internal combustion engine, having an induction passage for conducting air-fuel mixture into said engine, fuel control means for controlling the amount of fuel metered into said air induction passage, and throttle means for controlling the amount of air flowing into said engine through said induction passage, said control system comprising:

first detecting means for producing a first signal indicative of the load acting on said engine;

second detecting means for producing a second signal indicative of the operating conditions of said engine;

means responsive to said first signal for selecting one of plural learning values in accordance with the engine load, said plural learning values being related to a plurality of load regions of said engine;

learning means for learning the selected learning value, said learning means being arranged to prohibit learning of the selected learning value when a difference between the selected learning value and an adjacent learning value is more than a predetermined allowable value;

means responsive to said second signal for determining an amount of fuel for an optimum air-fuel ratio in accordance with the operation conditions of said engine and the selected learning value; and

means for producing an output signal indicative of the determined amount of fuel to apply it to said fuel control means.

4,705,003

APPARATUS FOR CONTROLLING ELECTROEXPANSIVE ACTUATOR AVOIDING DETERIORATION OF POLARIZATION

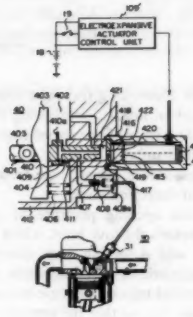
Yasuyuki Sakakibara, Nishio; Seiko Abe, Okazaki; Masahiro Tomita, Anjo; Hiroshi Yorita, Nishio; Takeshi Tanaka, Toyohashi, and Toshihiko Igashira, Toyokawa, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 17, 1985, Ser. No. 788,485

Claims priority, application Japan, Oct. 17, 1984, 59-216047; Sep. 2, 1985, 60-191969

Int. Cl.[4] F02M *41/12*; H01L *41/08*

U.S. Cl. 123—449 **13 Claims**



1. An apparatus for controlling an electroexpansive actuator comprising:

means for controlling expansion and contraction of said electroexpansive actuator;

means for generating a high voltage; and

means for applying said high voltage to said electroexpansive actuator for a first predetermined time period when a second predetermined time period has passed after said expansion and contraction controlling means completes said expansion and contraction operation upon said electroexpansive actuator.

4,705,004

FUEL INJECTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Hiroshi Takahashi; Masanobu Tamura, both of Toyota, and Kunihiko Sato, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 11, 1986, Ser. No. 906,088

Claims priority, application Japan, Sep. 12, 1985, 60-200489; Sep. 13, 1985, 60-201830

Int. Cl.[4] F02D *41/06*

U.S. Cl. 123—491 **13 Claims**

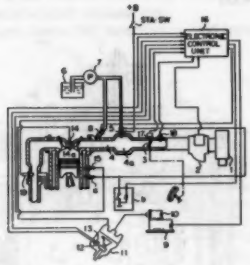
1. A fuel injection control system for an internal combustion engine comprising:

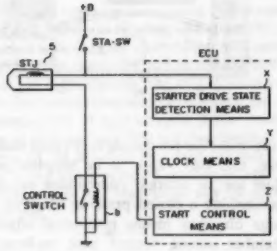
a cold start injection valve provided inside an intake pipe for performing fuel injection on cold starts;

a switch means for controlling energization of the cold start injection valve;

a starter drive state detection means for judging if a starter is being driven;

a clock means for detecting, by the starter drive state detection means, a change of the starter from a nonoperating state to an operating state and for counting time elapsed from said detected change; and





a start control means which designates a starting fuel injection when the elapsed time counted by the clock means is a first predetermined period or more and which prohibits the starting fuel injection when the elapsed time is a second predetermined period or more greater than the first predetermined period.

4,705,005

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Josef Güntert, Gerlingen; Walter Häfele, Fellbach, and Helmut Tschöke, Ostfildern, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

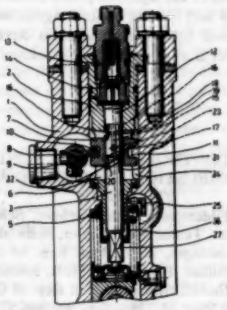
Filed Nov. 21, 1985, Ser. No. 800,248

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1984, 3447375

Int. Cl.⁴ F02M *59/34*

U.S. Cl. 123—500 **19 Claims**

1. A fuel injection pump for internal combustion engines comprising at least one pumping unit having a pump cylinder (2) and a pump piston (3) defining together a pump work chamber (12), a relief conduit (15) within said piston communicating with said work chamber, a control slide axially displaceable on the pump piston to control at least one fuel quantity control conduit (20,21) provided in the pump piston in communication with said relief conduit, a relief bore (23) in said control slide, said relief conduit being arranged to discharge into a fuel supply onset control opening (18,118) disposed in a surface of the pump piston, said fuel supply onset control opening being arranged to communicate at least during a bottom dead center position assumed by the pump piston with a suction chamber of lower pressure, said suction chamber being fillable with fuel disposed peripherally of a portion of the pump cylinder, and surrounding the control slide so as to surround a portion of the pump piston, and the fuel supply onset control opening discharges into the suction chamber upon emerging from within the pump cylinder at least during said bottom dead center position, said fuel supply onset control opening being arranged to be closed by the pump cylinder after the pump



piston has traversed a predetermined stroke regardless of displacement in position of said control slide, and fuel pressure is supplied to said pump work chamber until one of said quantity control conduits (20,21) is coincident with said relief bore (23) in said control slide.

4,705,006

FUEL INJECTION PUMP FOR AN INTERNAL COMBUSTION ENGINE COMPRISING A DEVICE FOR ADJUSTING THE INSTANT OF INJECTION FUEL DELIVERY

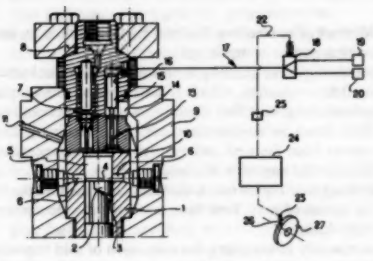
Dirk Bastenhof, 25, rue Tarbé des Sablons, 95600 Eaubonne, France

Filed Apr. 13, 1982, Ser. No. 367,980

Claims priority, application France, Apr. 16, 1981, 81 07685

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—506 **8 Claims**



1. A fuel injection pump for an internal combustion engine, the pump including a cylinder having a fuel admission chamber, a piston reciprocally disposed in the admission chamber for movement in one direction from a first position to a second position to decrease the volume of the chamber in an injection stroke and in an opposite direction from the second position to the first position to increase the volume of the chamber in a suction stroke, the piston having a head with a helical edge, a source of fuel outside the cylinder, admission ports located near the second position of the piston and connecting the source of fuel to the admission chamber, an injector means for delivering fuel from the admission chamber to the injector when the pressure in the admission chamber exceeds a predetermined value, and apparatus for adjusting the initiation of fuel delivery from the admission chamber to the injector, said apparatus including a bypass passage connecting the admission

chamber to the source of fuel, a bypass valve in the bypass passage, and a control system for controlling the valve to shut the bypass passage in response to a closing control signal, wherein the improvement comprises the bypass valve being shut by a flow of fuel leaving the admission chamber during the injection stroke of the injection piston under receipt by the control system of said closing control signal, and the bypass valve being opened by a partial vacuum developed in the admission chamber during the suction stroke of the injection piston.

4,705,007

METHOD OF CONTROLLING TANK VENTING IN AN INTERNAL COMBUSTION ENGINE AND APPARATUS THEREFOR

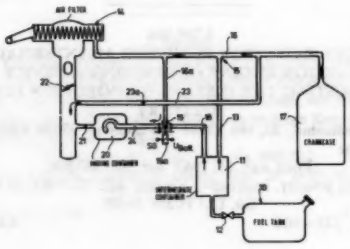
Günther Plapp, Filderstadt; Botho Zichner, Schwieberdingen; Rüdiger Jautelat, Tamm; Rolf Kohler, Schwieberdingen; Alfred Kratt, Trossingen, all of Fed. Rep. of Germany, and Hans-Martin Müller, Farmington Hills, Mich., assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 22, 1986, Ser. No. 866,577

Claims priority, application Fed. Rep. of Germany, May 31, 1985, 3519475

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—519 **8 Claims**



1. Method of controlling the venting of a tank in an internal combustion engine comprising:

determining a fuel quantity for the engine from a characteristic field evaluation, which is accessible to self-adaptation;

supplementing said fuel quantity with a regenerative fuel flow from an intermediate container receiving the fuel vapors from the tank and supplying said regenerative fuel flow to the engine at the intake region;

admitting said regenerative fuel flow into said intake region by means of a cyclical time control for a predetermined time duration;

continuously interrupting the admission of said regenerative fuel flow with permitted adaptation phases for the characteristic field evaluation;

said regenerative fuel flow being admitted to said intake region via a valve when there is a drop below a predetermined throttle flap angular position ($\alpha < \alpha_{tank}$);

said self-adaptation being selected from the group consisting of structural self-adaptation and global self-adaptation; and, said intermediate container being an active charcoal filter;

said valve being a tank-venting valve, said permitted adaptation phases being in the computer region for the metered fuel quantity and being initiated with a predetermined time delay (t_{ADV}) after said valve is interrupted; and,

providing the possibility of an uninterrupted regenerative fuel flow from said active charcoal filter when the predetermined tank venting threshold in the form of a throttle flap angular position threshold value (α_{tank}) is exceeded.

4,705,008

FUEL VAPORIZER

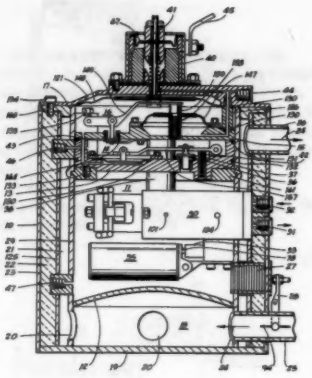
Edward O. Kleinholz, 1518 E. Cross St., Tulare, Calif. 93274

Continuation of Ser. No. 516,557, Jul. 25, 1983, Pat. No. 4,599,984. This application Jul. 14, 1986, Ser. No. 884,990

The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.

Int. Cl.[4] F02M *31/08, 31/12*

U.S. Cl. 123—557 **11 Claims**



1. A fuel vaporizer for producing fuel vapor under relatively high pressure, said fuel vapor to be supplied as a primary source of fuel for an internal combustion engine, said fuel vaporizer comprising a closed pressure chamber means; first heat exchange chamber means positioned adjacent to said pressure chamber means; second heat exchanger chamber means surrounding said pressure chamber means, mechanical pumping means for supplying liquid fuel to said pressure chamber means; mechanical pressure reducing means within said fuel vaporizer which reduces the pressure of the fuel vapor produced from said pressure chamber means to a suitable pressure acceptable for vacuum demand from an internal combustion engine induction system; air heating means for passing ambient air in heat exchange relationship with a heated component of an internal combustion engine and air passage means through which said heated air is supplied to said first heat exchange chamber means from which the heated air flows to said second heat exchange chamber means; means for controlling the pressure within the pressure chamber means; air motivating means circulating said heated air flow; and electric solenoid means positioned downstream of said pressure reducing means in the fuel vapor flow path, said solenoid means combined with vacuum means and vacuum diaphragm means to initiate and maintain vapor flow in relation to requirements of an internal combustion engine.

4,705,009

EXHAUST GAS RECIRCULATION CONTROL SYSTEM FOR AN ENGINE

Yoshiaki Asayama, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1986, Ser. No. 916,146

Claims priority, application Japan, Oct. 9, 1985, 60-226527

Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—571 **4 Claims**

2. An exhaust gas recirculation control system for an internal combustion engine, comprising:

(a) an intake duct (2) for introducing intake air to the engine;

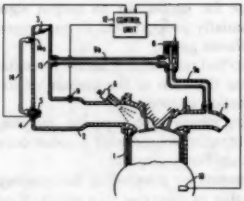
(b) a throttle valve (3: 19,20) mounted in said intake duct for controlling the flow rate of the intake air;

(c) an exhaust pipe (7) for discharging exhaust gas from the engine;

(d) conduit means (9a, 9b) for recirculating exhaust gas from said exhaust pipe back to said intake duct through an opening (13) therein disposed downstream of said throttle valve so that the recirculated exhaust gas is mixed with the intake air;

(e) an exhaust gas recirculation control valve (8) operatively coupled in the conduit means for controlling the flow rate of the recirculated exhaust gas;

(f) an oxygen sensor (4) mounted in said intake duct downstream of said opening for sensing the oxygen concentration in the mixed gas flowing in said intake duct;



(g) a control unit (12) for controlling said control valve in response to the output of said oxygen sensor to adjust the exhaust gas recirculation rate to a desired value; and

(h) means for introducing air as a reference gas to a reference air chamber (5) of said oxygen sensor from a point upstream of said opening (13) but downstream of said throttle valve (3: 19,20) such that said reference air is at substantially the same pressure as that of said mixed gas in said intake duct but free from any of said recirculated exhaust gas.

4,705,010

INJECTION SYSTEM WITH STRATIFIED FUEL CHARGE

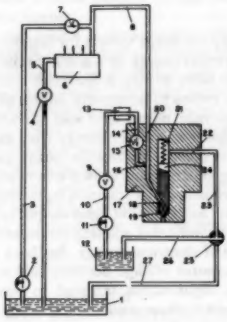
George S. Baranescu, 5316 Howard Ave., Western Springs, Ill. 60558

Filed Aug. 24, 1983, Ser. No. 526,273

Claims priority, application United Kingdom, Aug. 31, 1982, 8224793

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—575 14 Claims



1. A high pressure fuel injection system including an injection pump connected by means with at least one nozzle, said nozzle including a high pressure channel connected to the injection pump by said means, a pressure chamber connected with said high pressure channel and with the delivery channel of the nozzle, said delivery channel being closed by means between consecutive injections, said high pressure fuel injection system including also two fuel tanks, one tank to which the injection pump is connected containing a fuel, called first fuel, whose characteristics are suitable for the operation of a diesel engine, the other tank containing a fuel, called second fuel, whose characteristics are not suitable for the operation of a diesel engine, the high pressure fuel injection system having the capability to inject periodically first fuel together with second fuel, said high pressure fuel injection system being characterized by the capacity to stratify the second fuel charge between portions of first fuel called pilots, the stratification occurring between consecutive injections in a region of the high pressure channel, said region where the stratification of the two fuels occurs being so selected that the second fuel charge is injected in the next cycle interspersed with pilots of first fuel, starting and ending with pilots of first fuel, said high pressure fuel injection system being also characterized by the capacity to switch from dual fuel operation to the operation with first fuel only and vice-versa from cycle to cycle, these capacities being achieved by several means including

a nozzle provided with two additional channels, called the first and the second additional channels, said additional channels being connected with said high pressure channel close to said pressure chamber, each additional channel being provided with a one-way check valve, said nozzle having a pressure chamber of very small volume, and a configuration of the high pressure channel which prevent the mixing between the second fuel charge and the pilots of first fuel during their stratification as well as during their injection,

a source of second fuel which delivers second fuel from the respective tank into said second additional channel, the second fuel being delivered between consecutive injections at controllable pressure and temperature, in controllable amount, and with controllable timing, said source of second fuel being electronically programmable,

a main source of first fuel which delivers first fuel from the respective tank into said first additional channel, the first fuel being delivered between consecutive injections at controllable pressure and temperature, in controllable amount, and with controllable timing, said main source of first fuel being electronically programmable,

means which connect the high pressure section of the injection system with the tank of first fuel between consecutive injections for a period between selected instants of the cycle,

means which ensure a selected pressure in the high pressure section of the injection system between consecutive injections,

a drain provided with means which direct the fuel leakages, either to the tank of second fuel or to the tank of first fuel, dependent upon the operation of the injection system with first fuel and second fuel, or with first fuel only.

4,705,011

AIR INTAKE SIDE SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH AN IMPROVED OPERATION FOR A LARGE AMOUNT OF THE SECONDARY AIR

Yoshitaka Hibino; Takeshi Fukuzawa; Hiromitsu Sato, and Masahiko Asakura, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1986, Ser. No. 916,228

Claims priority, application Japan, Oct. 9, 1985, 60-225815; Oct. 31, 1985, 60-245853

Int. Cl.[4] F02M *23/04*

U.S. Cl. 123—589 2 Claims

1. An air intake side secondary air supply system for an internal combustion engine having an intake air passage with a carburetor and an exhaust gas passage, comprising:

a first air intake side secondary air supply passage leading to

the intake air passage, downstream of a throttle valve of said carburetor;

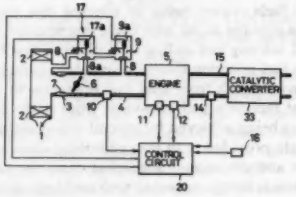
a second air intake side secondary air supply passage also leading to the intake air passage, downstream of said throttle valve of said carburetor;

a first open-close valve disposed in said first air intake side secondary air supply passage;

an oxygen concentration sensor disposed in said exhaust passage and producing an output signal;

a second open-close valve disposed in said second air intake side secondary air supply passage; and

duty control means responsive to said output signal of said oxygen concentration sensor and connected to said first



and second open-close valves, operative to repeatedly calculate a valve open time period in a duty cycle in response to a result of determination of air/fuel ratio by using said output signal of said oxygen concentration sensor, and opening said first open-close valve during said output valve open time period in each of said duty cycles, wherein said duty control means is operative to open said second open-close valve and reducing said calculated valve open time period by a period corresponding to an amount of air flow through said second open-close valve, to reduce a period of opening of said first open-close valve, only when said calculated valve open time period is longer than a predetermined period.

4,705,012

AIR INTAKE SIDE SECONDARY AIR SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE WITH A DUTY RATIO CONTROL OPERATION

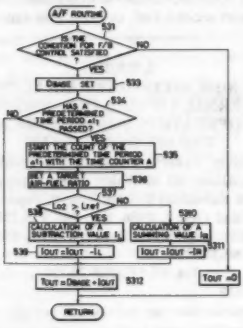
Tomohiko Kawanabe, Utsunomiya; Masahiko Asakura, Tokorozawa; Noritaka Kushida, Tokyo; Takanori Shiina, Utsunomiya, and Minoru Muroya, Wako, all of Japan, assignors to Honda Giken Kogyo Kaibushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1985, Ser. No. 807,716

Claims priority, application Japan, Feb. 16, 1985, 60-28757; Apr. 26, 1985, 60-90652

Int. Cl.[4] F02M *23/04*

U.S. Cl. 123—589 **8 Claims**



3. An air intake side secondary air supply system for an internal combustion engine having intake and exhaust passages, said intake passage being provided with a carburetor producing an air-fuel mixture and having a throttle valve controlling the air-fuel mixture flow, said secondary air supply system comprising:

an air intake side secondary air supply passage leading to the intake passage on the downstream side of the throttle valve of said carburetor;

a flow control valve disposed in said air intake side secondary air supply passage for controlling the amount of the secondary air supply so as to make leaner the air/fuel ratio of the air-fuel mixture downstream of the throttle valve;

an oxygen concentration sensor disposed in the exhaust passage for producing an output signal whose level is substantially proportional to an oxygen concentration of the exhaust gas;

target air/fuel ratio setting means for setting a target air/fuel ratio on the basis of the amount of load of said internal combustion engine;

comparing means for comparing said output of said oxygen concentration sensor with a value corresponding to said target air/fuel ratio; and

control means for controlling the opening of said flow control valve in response to a result of comparison by said comparing means.

4,705,013

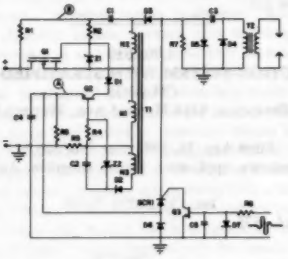
REGULATED POWER SUPPLY FOR A SOLID STATE IGNITION SYSTEM

Floyd M. Minks, 2700 Partin Settlement Rd., Kissimmee, Fla. 32743

Filed Oct. 28, 1985, Ser. No. 791,764

Int. Cl.[4] F02P *1/00*

U.S. Cl. 123—598 **6 Claims**



1. An energy discharge system for supplying energy from a source of electrical energy to a spark discharge unit comprising a means to store energy, a discharge circuit having a controlled switch means to selectively discharge energy stored in said energy storage means into said spark discharge unit, a blocking oscillator to transfer energy from said source of electrical energy to said energy storage means, said blocking oscillator including an electronic switch means with an input terminal, output terminal, and a common input-output terminal, said output terminal and common input-output terminal connected in series with an inductive winding means and a resistive shunt to said source of electrical energy, feedback means for applying an input control voltage between said input terminal and said common input-output terminal to turn said electronic switch means on in phase with a voltage supplied to said inductive winding means from said source of electrical through said electronic switch means, means to remove said input control voltage between said input terminal and common input-output terminal in response to a preselected voltage level across said resistive shunt means thus turning off said electronic switch means thus transferring energy stored in said inductive winding means through a rectifying means to said energy storage means.

4,705,014

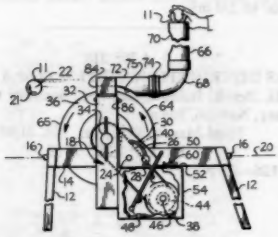
VARIABLE SPEED SINGLE-WHEELED BALL PROPELLING MACHINE

Edward W. Kahelin, 3921 Kitten Clr., Huntington Beach, Calif. 92649

Continuation of Ser. No. 397,768, Jul. 13, 1982, abandoned. This application Dec. 27, 1984, Ser. No. 687,482

Int. Cl.⁴ F41B *15/00*

U.S. Cl. 124—1 **3 Claims**



1. A machine for propelling balls such as softballs and baseballs in a predetermined direction with a spin axis including:

an axle mounted to a support frame;

a ball to be propelled having a predetermined diameter;

a pneumatic tire mounted for rotation on said axle having an outer surface adapted to make contact with said ball to be propelled;

means operatively connected to said pneumatic tire to spin said pneumatic tire with a predetermined rotation about said axle; and

a ball chute connected to said support frame and positioned at a right angle to said axle adjacent and in alignment with said pneumatic tire to guide said ball to be propelled into contact with said pneumatic tire and to guide said ball to be propelled while in contact with said pneumatic tire, said ball chute having:

a central position where said chute is at a minimum distance from said outer surface;

an outer end; and

an inner surface with a linear section generally parallel to a plane tangential to the upper surface of said pneumatic tire and which is relatively rigid with respect to said pneumatic tire outer surface, said inner surface extending from said central position to said outer end, said inner surface having:

a cross-section which is semi-circular with a diameter that is slightly larger than said predetermined diameter of said ball to be propelled, said inner surface facing said pneumatic tire outer surface and being fixedly spaced therefrom at said outer end a distance essentially equal to said predetermined diameter of said ball, whereby said ball to be propelled is released from contact with said pneumatic tire outer surface and said chute inner surface of said predetermined diameter essentially simultaneously as said ball to be propelled is propelled in said predetermined direction.

4,705,015

COMPOUND BOW DRAW POSITION INDICATING DEVICE

Fernando Troncoso, Jr., 14090-6100 Rd., Montrose, Colo. 81401

Filed Jun. 6, 1986, Ser. No. 871,468

Int. Cl.⁴ F41B *5/00*

U.S. Cl. 124—24 R **9 Claims**

1. An improved innner cam-type compound archery bow assembly, said assembly comprising, in combination:

a. a compound archery bow having

i. an elongated riser, including a handle and an arrow window,

ii. a pair of flexible limbs connected to opposite ends of said riser and extending rearwardly therefrom,

iii. a pair of wheels rotatably secured to the free tips of said limbs,

iv. a bracket secured to said riser below said handle and extending rearwardly therefrom,

v. cam means rotatably connected to said bracket,

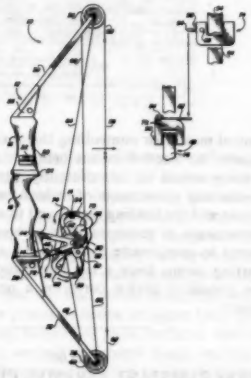
vi. a bowstring disposed rearwardly of said cam means,

vii. first and second wheel cables trained around said wheels, with opposite ends thereof connected to opposite ends of said bowstring and to opposite ends of said cam means,

viii. first and second sets of cam cables secured to said means and to opposite ends of said limbs; and,

b. a drawcheck comprising

i. a clicker component having a mounting block releasably secured to one of said bracket and said cam means and



bearing a flexible strip which gives an audible click when flexed and allowed to snap back, said block comprising an inverted generally U-shaped block with said strip mounted on the top thereof and extending laterally thereof at one side thereof, the portion of said block top adjacent said laterally extending portion of said strip being curved downwardly away from said strip to prevent excessive bending stress in said strip during clicking thereof; and

ii. an activator component having a fitting adjustably attached to the other of said bracket and said cam means and bearing an activator pin adapted to flex said strip in order to effect said click, said clicker component and said activator component being positioned on said cam means and said bracket such that when said bowstring is drawn rearwardly to a desired full draw, rotation of said cam means effects contact and activation of said clicker component by said activator component to audibly signal said full draw.

4,705,016

PRECISION DEVICE FOR REDUCING ERRORS ATTRIBUTED TO TEMPERATURE CHANGE REDUCED

Shinji Sekiya, Tokyo, Japan, assignor to Disco Abrasive Systems, Ltd., Tokyo, Japan

Filed May 2, 1986, Ser. No. 858,773

Claims priority, application Japan, May 17, 1985, 60-72333[U]; Jan. 24, 1986, 60-11900

Int. Cl.⁴ B28D *1/04*

U.S. Cl. 125—13 R **11 Claims**

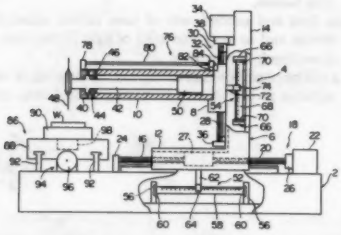
1. A precision device for performing an operation on an object, the precision device comprising

a holding means adapted to hold the object,

a supporting means for supporting an operating element,

a driving means for moving at least one of the supporting means and the holding means in a predetermined direction,

a detecting means including a measuring standard member formed of a material having a low coefficient of linear expansion and a detector for detecting a thermal expansion of at least a part of the supporting means in said predetermined direction relative to the measuring standard member and providing a signal representative of the extent of the thermal expansion, and



a control means for controlling the operation of the driving means, the control means being adapted to control the driving means to intermittently perform a plurality of positioning movements of at least one of the supporting means and the holding means and to adjust the positioning movements in response to the signal from the driving means to compensate for a thermal expansion of the supporting means since a last positioning movement before the precision device performs a next operation on the object.

4,705,017

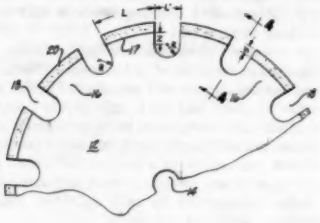
STRESS RESISTANT ABRASIVE CUTTING WHEEL

Roger L. Lewis, Leawood, Kans., assignor to Federal-Mogul Corporation, Southfield, Mich.

Continuation-in-part of Ser. No. 766,998, Aug. 19, 1985, abandoned. This application Mar. 19, 1986, Ser. No. 842,715

Int. Cl.[4] B28D *1/04*

U.S. Cl. 125—15 **11 Claims**



1. A rotatable cutting wheel for cutting rock or rock-like material, said cutting wheel comprising:

a circular generally disc-shaped drive core having a plurality of circumferentially extending and circumferentially-spaced support surfaces, each of said support surfaces having affixed thereto an abrasive cutting element capable of cutting an abradable rock or rock-like material, said cutting element having a predetermined radial height;

said core having a plurality of gullets, each of said gullets having opposed faces and each oneof said gullets being located between said opposed faces and between each adjacent pair of cutting elements, each one of said gullets extending between a closed gullet end located radially inwardly of said cutting element and an open gullet end being in communication with a space between said adjacent pair of said cutting elements; and

at least several of said plurality of gullets having a width defined between said opposed faces within a range of 1.0 inch to 1.5 inch

and wherein several of said plurality of gullets have an area defined between said opposed faces and between said adjacent pair of cutting elements within an area range of 1.0 in^2 to 2.0 in^2.

4,705,018

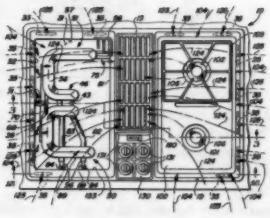
GAS DISTRIBUTION SYSTEM FOR A RANGE

Stanley H. Beach, Indianapolis, Ind., assignor to The Maytag Company, Newton, Iowa

Filed Mar. 5, 1987, Ser. No. 21,961

Int. Cl.[4] F24C *3/12*

U.S. Cl. 126—39 N **8 Claims**



1. A gas distribution system for a cooking appliance including housing means defining a burner box, a recessed burner pan fixed within said burner box and further including a burner assembly removably mounted in said burner pan and proximity ventilation means having a plenum enclosure with an air intake juxtaposed to said burner pan, comprising: manifold means mounted within said housing means in close juxtaposition to said burner pan and said proximity ventilation plenum enclosure, said manifold means including a substantially flat and horizontal first surface, a second surface spaced from said first surface and peripheral wall means interconnecting said first and second surfaces to define a manifold chamber; gas supply means connected to said second surface for supplying gas to said manifold chamber; a plurality of gas valves mounted in a closely spaced cluster arrangement on said first surface of said manifold means and including an outlet directed generally toward said burner pan; a plurality of right angle inlet means disposed between said burner box and said burner pan and fixed to said burner pan with each including an orifice hood directed into said burner pan for receiving said burner assembly; and gas distribution means extending between the outlet of each of said gas valves and one of said inlet means for conducting gas between said manifold means and said burner assembly.

4,705,019

GAS DOWNDRAFT RANGE WITH SELECTIVELY INTERCHANGEABLE BURNERS

Stanley H. Beach, Indianapolis, and Richard W. Brangan, Greenwood, both of Ind., assignors to The Maytag Company, Newton, Iowa

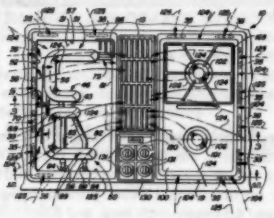
Filed Mar. 5, 1987, Ser. No. 22,284

Int. Cl.[4] F24C *3/00*

U.S. Cl. 126—39 E **10 Claims**

1. A gas cooking appliance operable with interchangeable burner units, comprising: housing means defining a burner box and at least one upwardly facing non-removable burner pan therein; a gas supply system including manually operable gas valve means and further including inlet means having an orifice hood mounted on said burner pan, said burner pan and said

orifice hood being adapted to interchangeably receive first and second burner means, said first burner means including structure for accomplishing a grilling function and said second burner means including structure for accomplishing a conventional surface cooking function; proximity ventilation means including exhaust intake means adjacent said burner pan and further including motor driven blower means for inducing airflow into said exhaust intake means; first switch means associated with said burner pan for operation by one only of said first and second burner means and in circuit connection



with said motor driven blower means; and second switch means operably associated with said gas valve means and in circuit connection with said first switch means, said first and second switch means being cooperable upon operation of said gas valve means to complete an electrical circuit to said motor driven blower means for automatic operation thereof with said first burner means operably installed in said burner pan and to prevent automatic operation of said motor driven blower means with said second burner means operably installed in said burner pan.

4,705,020

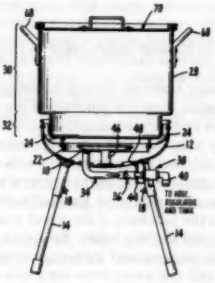
GAS COOKER

Linus K. Hahn, 3085 Alexis Dr., Palo Alto, Calif. 94304

Continuation of Ser. No. 653,673, Sep. 21, 1984, abandoned. This application Jul. 16, 1986, Ser. No. 886,512

Int. Cl.[4] F24C *3/00*; **A47J** *31/00*

U.S. Cl. 126—41 R **10 Claims**



1. An improved gas cooker for heating objects of the type including a housing, a gas burner fuel to the gas burner, wherein the gas burner includes a plurality of apertures from which the gas fuel can be emitted for combustion in the form of a flame which supplies heat, the improvement comprising

means positioned apart from the gas burner and opposite the apertures for deflecting the heat towad the object to be heated comprising a ring having a face about its perimeter; and

a plurality of arms connected to and exending between the housing and the ring for supportig the ring relative o the housing and gas burner, wherein said ring is positioned about and spaced apart from the periphery of the gas burner so that said face is transverse to the direction in which the flame is emitted from the gas burner and so that air flow in the region between the gas burner and said face is substantially unobstructed.

4,705,021

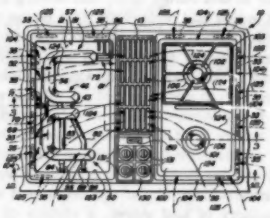
GAS BURNER CONSTRUCTION

Stanley H. Beach, Indianapolis, Ind., assignor to The Maytag Company, Newton, Iowa

Filed Mar. 5, 1987, Ser. No. 22,366

Int. Cl.[4] A47J *37/00*

U.S. Cl. 126—41 R **7 Claims**



1. A gas burner for cooking food with an open flame, comprising: means defining a generally hollow horizontally elongated burner body including an upper body portion and a lower body portion, said upper body portion having a generally downwardly extending first peripheral flange and imperforate top wall means extending inwardly and upwardly from said first peripheral flange with all plane surfaces of said first peripheral flange and said top wall means being disposed only in vertical and angular planes to define an upper body portion free of upwardly facing horizontal plane surfaces, said lower body portion having a second peripheral flange mating with said first peripheral flange and further having bottom wall means extending inwardly and downwardly from said second peripheral flange, said first peripheral flange overlapping and continuously connected with said second peripheral flange to form a burner body completely free of upwardly facing horizontal plane surfaces on which drippings may collect and cause flare-ups; a plurality of gas ports formed in said bottom wall means of said lower body portion and spaced about the periphery thereof, said gas ports located beneath the widest portion of said burner body for preventing contamination from above; and means for supplying said burner body with a combustible mixture of gas and air.

4,705,022

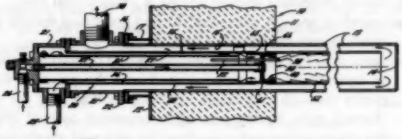
RECUPERATIVE RADIANT TUBE HEATING SYSTEM

David W. Collier, Milwaukee, Wis., assignor to Eclipse, Inc., Rockford, Ill.

Filed Sep. 25, 1986, Ser. No. 911,971

Int. Cl.[4] F24C *3/00*

U.S. Cl. 126—91 A **5 Claims**



1. A recuperative radiant tube heating system, said system comprising an outer radiant tube made of heat-resistant material and having a closed forward end, recuperator tube means located within said radiant tube and having an open forward end spaced upstream from the forward end of said radiant tube,

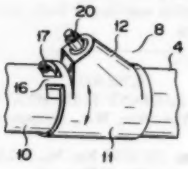
an inner tube located within said recuperator tube means and having a forward end spaced upstream from the forward end of said recuperator tube means, a burner head located within said recuperator tube means between the forward end thereof and the forward end of said inner tube, and a gas supply pipe located within said inner tube for supplying gaseous fuel to said burner head, said inner tube being spaced radially inwardly from said recuperator tube means and coacting therewith to define an annular passage for the flow of combustion air to said burner head, said recuperator tube means being spaced radially inwardly from said radiant tube and coacting therewith to define an annular passage for the reverse flow of exhaust gases for preheating said combustion air prior to delivery of the combustion air to said burner head, said heating system being characterized in that said recuperator tube means comprise an upstream tubular section, an intermediate tubular section made of a more heat-resistant material than said upstream tubular section and secured thereto, and a downstream tubular section detachably secured to said intermediate tubular section, said burner head being located within said intermediate tubular section, said burner head comprising a sleeve formed separately of said intermediate tubular section and having an outer side disposed in close face-to-face engagement with the inner side of said intermediate tubular section around substantially the entire perihery of said sleeve, a portion of said sleeve having a cylindrical outer wall defining said outer side, the interior of said sleeve being frustoconical and tapering in diameter upon progressing forwardly, said burner head further including a plate extending perpendicular to the axis of said sleeve and closing the upstream end portion of said sleeve, a substantial portion of said sleeve extending downstream from said plate, and a series of angularly spaced passages formed through said plate and communicating with said intermediate tubular section to deliver combustion air into said sleeve.

4,705,023

ENDOSCOPE HAVING ROTATABLE CLAMP INSERTING SECTION

Kelichi Arai, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 14, 1986, Ser. No. 863,235
Claims priority, application Japan, May 20, 1985, 60-107735
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 **9 Claims**



1. An endoscope comprising:

a tubular operating section having a longitudinal axis;

an inserting section connected to said operating section and inserted into the patient's body cavity;

a clamp inserting section provided on said operating section, an operating tool being inserted into the patient's body cavity through said clamp inserting section; and

a channel tube having one end connected to said clamp inserting section and extending through said clamp inserting section into said inserting section;

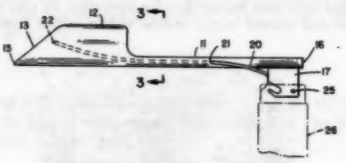
said operating section including means for supporting said clamp inserting section such that said clamp inserting section is rotatable in the circumferential directions of said operating section by an angle less than 360° .

4,705,024

LARYNGOSCOPE FOR USE WITH PHARYNGEAL OBSTRUCTIONS

Cedric R. Bainton, 50 Ventura, San Francisco, Calif. 94116

Filed Jun. 20, 1986, Ser. No. 876,816
Int. Cl.[4] A61B *1/26*
U.S. Cl. 128—11 **3 Claims**



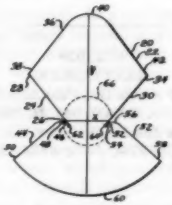
1. A laryngoscope blade comprising a first end including means to attach to a handle, a tubular portion beveled to a second end, a trough-shaped portion berween said first end and said tubular portion, said tubular portion being between 5 centimeters and 8.5 centimeters long, and illumination means in the interior of said tubular portion.

4,705,025

HEEL PADDING

Richard G. Dedo, 175 Denise Dr., Hillsborough, Calif. 94010

Filed Jun. 20, 1986, Ser. No. 876,780
Int. Cl.[4] A61F *5/30, 5/14*; A61B *19/00*
U.S. Cl. 128—153 **14 Claims**



1. A heel pad as formed with regard to orthogonal x and y axes, comprising:

a sheet of porous material having a first generally straight side edge spaced from the juncture of the x and y axes and having a first end located slightly below the x axis on one side of the y axis, said first side edge extending upwardly along the y axis and away from the y axis at an acute angle to the y axis and terminating at a second end substantially above the x axis, a second generally straight side edge spaced from the juncture of the x and y axes and having a first end located slightly below the x axis on the other side of the y axis, said second side edge extending upwardly along the y axis and away from the y axis at an acute angle to the y axis and terminating at a second end substantially above the x axis at approximately the y coordinate of the second end of the first side edge, a third side edge having a first end extending from the second end of the first side edge in a generally straight line upwardly along and toward the y axis to an arcuate portion crossing the y axis, and a second end extending from the second end of the second side edge in a generally straight line upwardly along and toward the y axis to said arcuate portion, a fourth side edge having a first end extending from the first end of the first side edge in an arcuate portion located above the first ends of the first and fourth side edges adjacent the x axis and extending in a generally straight line downwardly from the x axis and directed outwardly from the y axis and terminating in a second end, a fifth side

edge having a first end extending from the first end of the second side edge in an arcuate portion located above the first ends of the second and fifth side edges adjacent the x axis and extending in a generally straight line downwardly from the x axis and directed outwardly from the y axis and terminating in a second end, and an arcuate sixth side edge connecting the second ends of the fourth and fifth side edges and crossing the y axis.

4,705,026

COAXIAL LOCATION FOR CONTACT FREE COMMINUTION OF CONCREMENTS

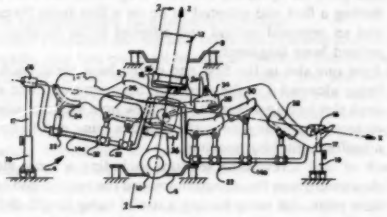
Christian Chaussy, Los Angeles, Calif.; Wolfgang Hepp, Immenstaad, Fed. Rep. of Germany; Dick van Rijn, Eriskirch, Fed. Rep. of Germany, and Bernd Forssmann, Friedrichshafen, Fed. Rep. of Germany, assignors to Dornier System GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed May 8, 1985, Ser. No. 732,364

Claims priority, application Fed. Rep. of Germany, May 15, 1984, 3417985

Int. Cl.[4] A61N *1/00*

U.S. Cl. 128—24 A **18 Claims**



1. In a device for contactfree comminution of concrements in the body of a living being including a shock wave generating and reflecting system, at least one concrement locating system and a rest for said living being the improvement comprising:

at least one equipment carrier for said shock wave system and said one or more locating systems; and

means for displaceably supporting said equipment carrier for selective positioning said shock wave system or said one locating system in a particular position with respect to said rest to thereby obtain a particular position of either and both said shock wave system and said one locating system with respect to the rest and a body having been placed on said rest, so that the shockwave system can replace said locating system in said one particular position.

4,705,027

INTRAMEDULLARY NAIL

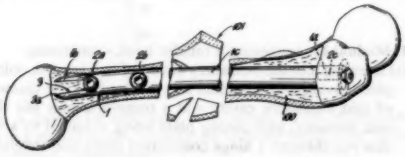
Kaj Klaue, Bern, Switzerland, assignor to Synthes Ltd. (U.S.A.), Paoli, Pa.

Filed May 14, 1985, Ser. No. 733,930

Claims priority, application Switzerland, May 14, 1984, 2385/84

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 YY **12 Claims**



1. An intramedullary buttressing nail for stabilizing the position of bone fragments subsequent to the reduction of a bone fracture, said nail having a shank with a head and a tip for insertion into the medulla of a bone along the long axis of the bone, a slot adjacent the tip of the nail for slidingly engaging within said slot a bolt, previously inserted into the bone in a direction transverse to the axis of the bone, on the distal side of the fracture, as said nail is linearly advanced along the bone axis, said slot having a back wall which said bolt is adapted to abut when seated in the slot, thus limiting travel of the distal fragment of the bone in the proximal direction to avoid shortening of the bone during healing; said means in said nail for receiving a second fastener means for fixing said shank relative to said medulla.

4,705,028

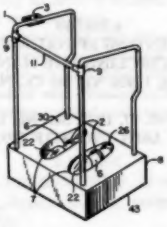
BODY STIMULATING MECHANICAL JOGGER

Phillip J. Melby, P.O. Box 656, Mason City, Iowa 50401

Filed Sep. 26, 1986, Ser. No. 911,884

Int. Cl.[4] A61H *1/02*

U.S. Cl. 128—25 B **7 Claims**



1. A body stimulating mechanical jogger wherein the improvement comprises:

(a)—a housing and

(b)—mounted therein

an electric motor drive, cam wheels, driven by said electric motor drive through a

(c)—drive belt connected to a driven wheel, mounted on a shaft, on which shaft said cam wheels are rigidly mounted and

(d)—said cam wheels in contact with foot treadles to actuate said foot treadles in a reciprocating motion, and

(e)—switch control means to actuate said electric motor drive,

(f)—and handle bar frame mounted on said housing and

(g)—said switch control means mounted on said handle bar frame of said mechanical jogger.

4,705,029

EXPANDABLE URETHRAL BOUGIES

German Borodulin, 2518 Clement St., #4, San Francisco, Calif. 94121; Maxim Persidsky, 35 Temescal Ter., San Francisco, Calif. 94118, and Alexander Shkolnik, 962 El Camino Real, #202, San Mateo, Calif. 94402

Continuation-in-part of Ser. No. 861,871, May 12, 1986, abandoned, which is a division of Ser. No. 778,760, Sep. 23, 1985, Pat. No. 4,607,626, which is a continuation-in-part of Ser. No. 621,842, Jun. 18, 1984, abandoned. This application Aug. 15, 1986, Ser. No. 896,810

Int. Cl.[4] A61H *1/00*

U.S. Cl. 128—43 **4 Claims**

1. A mechanically-exandable bougie comprising:

radially-expandable probe means formed by a pair of rods, each having a semicircular cross-section, said rods forming a complete circle in their cross section in an assembled state of said bougie,

said rods being pivotally connected to each other at a front end of each of said rods, said rods having at the rear ends

thereof a thread on one of said rods and a plain portion on the other rod having a smaller radius than the inner diameter of said thread,

a pair of longitudinal, diametrically-opposed grooves formed on mating inner surfaces of said rods, said rods having a pair of aligned holes through their walls in the

front portion of said bougie and within said grooves, the depth of said grooves from said holes to the front end of said bougie being shallower than between said holes and said rear ends thereof, and

a sleeve having an inner thread engageable with said thread on said one of said rods.

4,705,030

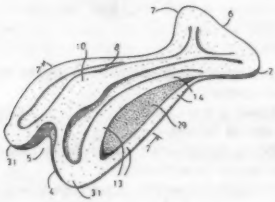
HAND AUGMENTING SPINAL MANIPULATOR ENCIRCLING THE HAND

Phillip S. Tepperberg, 16900 NE. 5th Ct., North Miami Beach, Fla. 33162

Filed Feb. 17, 1987, Ser. No. 15,784

Int. Cl.[4] A61H *7/00*; A61F *5/00, 5/01*

U.S. Cl. 128—69 **14 Claims**



1. A device intended for chiropractic treatment of the spine comprising:

a hand encircling means for receiving and protecting the open hand of an operator with the finger tips exposed on a first side of the device and the thumb and heel of said hand exposed on the opposite side of said device when said device is in operating position on said hand for treatment use;

an elongate first surface means on the exterior of said hand encircling means, extending from a head portion beyond the thumb side of the palm of said hand on a first end through a body portion over said palm to a tail portion beyond the opposite side of said palm on a second end, said first surface means including:

a. an elongate groove means extending from said head portion to said tail portion for receiving the spinous processes of the vertebrae of said spine when said first surface means is applied to said spine for said treatment;

b. elongate, transverse-process-engaging ridge means arranged on each of the two sides of said groove means for engaging the transverse processes of said vertebrae;

an elongate, arcuate, second surface means on the exterior of said hand encircling means extending from said head portion to said tail portion for engaging a solid treatment surface during said treatment while said first surface means is engaging said spine, said arcuate shape arranged to provide a tangential initial contact with said surface and a rolling contact progressing toward said head portion during the treatment motion.

4,705,031

OSTEOSYNTHESIS PLATE FOR PRESSURE STABILIZATION

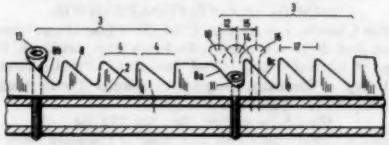
Dietmar Wolter, Lohmühlenstrasse 5, 2000 Hamburg 1, Fed. Rep. of Germany

Filed May 5, 1986, Ser. No. 859,650

Claims priority, application Fed. Rep. of Germany, May 6, 1985, 8513286[U]

Int. Cl.[4] A61M *37/00*

U.S. Cl. 128—92 YP **4 Claims**



1. An osteosynthesis plate for the pressure stabilization of bone fragments, comprising;

a base plate for spanning the bone fragments, the base plate having a first end adapted to lie on a first bone fragment and an opposed second end adapted to be secured on a second bone fragment;

at least one slot in the first end of the base plate, each slot being elongated in the direction between said plate ends, each slot having a plurality of screw hole sections adapted to receive a bone screw, the sections lying end-to-end on a uniform pitching spacing;

each of said screw hole sections including a ramp sloped downwardly in the direction toward the second end of the base plate, the ramp having a useful ramp length defined by the distance the base plate would move relative to the first bone fragment as a bone screw is advanced into the bone fragment from an initial position at the top of the ramp to a final position at the bottom of the ramp;

wherein the pitch for the screw hole sections in a given slot is no greater than the number of slots in said first end of the plate, multiplied by the useful ramp length.

4,705,032

ANCHORING ROD FOR TUBULAR BONES

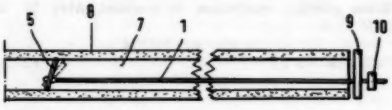
Arnold Keller, Kayhude, Fed. Rep. of Germany, assignor to Waldemar Link GmbH & Co., Fed. Rep. of Germany

Continuation of Ser. No. 899,838, Aug. 25, 1986, abandoned, which is a division of Ser. No. 763,751, Aug. 7, 1985, Pat. No. 4,657,549, which is a continuation of Ser. No. 630,037, Jul. 12, 1984, abandoned. This application Jan. 6, 1987, Ser. No. 4,280

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1983, 3330062

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 YZ **7 Claims**



1. Method for anchoring a tubular bone, comprising:

(a) inserting into the medullary cavity of said bone an oblong plate having a longitudinal axis greater than the diameter of said medullary cavity and a transverse axis less than said diameter, said oblong plate being mounted to a tension rod through a hinge connection along said longitudinal axis and eccentric with respect to said oblong plate; and

(b) applying elongating tension to said tension rod to anchor

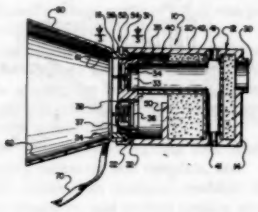
said oblong plate to the inner surface of said medullary cavity.

4,705,033

HUMIDIFICATION FACE MASK

Paul F. Halfpenny, Van Nuys, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Jul. 19, 1984, Ser. No. 632,370
Int. Cl.[4] A61M *15/00*
U.S. Cl. 128—201.13 **7 Claims**



1. A humidification face mask comprising:

a closed container having side walls and first and second end walls, said first end wall having an aperture therethrough;

a flexible tubular-shaped member having first and second ends, said first end coupled to said second end wall, and said second end adapted to fit over the mouth and nose;

an inlet valve means biased to the closed position adapted to allow humidified air flow from the interior of said container to the interior of said member;

vent valve means biased to the closed position adapted to allow exhausted air in said member to flow into said container;

an open-celled foam member mounted within said container between said aperture and said inlet valve, said foam member adapted to receive and hold water; and

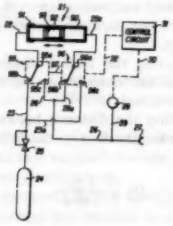
passage means coupling said vent valve to the exterior of said container, said passage means passing through said foam member.

4,705,034

METHOD AND MEANS FOR DISPENSING RESPIRATING GASES BY EFFECTING A KNOWN DISPLACEMENT

Warren E. Perkins, 9960 S. A-1-A, Apt. #1901, Jensen Beach, Fla. 33457

Filed Oct. 2, 1985, Ser. No. 783,121
Int. Cl.[4] A61M *15/00*; G01F *11/06*
U.S. Cl. 128—204.21 **12 Claims**



1. A device for supplying premeasured doses of respirating gas to a patient in synchronization with the respiratory cycle of said patient, comprising:

a source of respirating gas at relatively high pressure;

means comprising a cylinder closed at both ends and having disposed within the cylinder a piston member shorter than said cylinder and free to reciprocate back and forth from one end of said cylinder to the other for premetering a single dose quantity of said respirating gas and for temporarily storing said metered dose;

means for sensing the onset of inhalations of said patient and for producing signals in response to said sensing;

gas flow routing means operating independently of the position of said piston member and acting only in response to a sensed inhalation signal for routing the flow of respirating gas back and forth from a first path to a second path in response to said produced signals, said routing means arranged to cause said respirating gas to flow along said first path in response to a produced signal, at a pressure greater than atmospheric, to one interior end of said cylinder and to drive said piston to the other end of said cylinder, said routing means further arranged to cause said respirating gas to flow along said second path in response to a successive produced signal, at a pressure greater than atmospheric, to the other interior end of said cylinder and to drive said piston back to the opposite cylinder end, the movement of said piston from one end of said cylinder to the other serving to drive a metered dose of respirating gas out of said cylinder, and

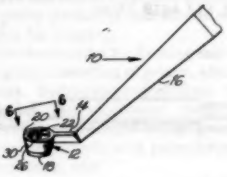
cannula means for conveying said metered dose of respirating gas to the patient, said cannula means arranged to communicate through said flow routing means between the interior end of said cylinder opposite to that of the entering respirating gas and said patient.

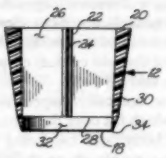
4,705,035

PARALLAX-FREE OPTICAL ZONE MARKER

Thomas B. Givens, Bradenton, Fla., assignor to Visitec Company, Sarasota, Fla.

Filed Sep. 2, 1986, Ser. No. 902,766
Int. Cl.[4] A61F *9/00*
U.S. Cl. 128—303 R **16 Claims**





1. An optical zone marker to be used in surgical ophthalmology for impressing into an eye cornea outer surface of a human eyeball a circular indentation whose imaginary center is substantially aligned with the eye's optical center, said marker comprising:

an elongated handle and collar portion, said handle integrally molded with, and generally laterally extending from, said collar portion;

said collar portion having a passageway therethrough having a central longitudinal axis and also having a pair of crossplanes diagonally disposed ont to another across said

passageway and extending longitudinally within said passageway;

said collar portion having upper and lower end margins;

said crossplanes having upper and lower edge margins and intersecting one another along said central axis;

said collar portion lower end margin circular and having an imaginary center in alignment with said central axis and shaped to form the circular indentations into the eye cornea outer surface;

said crossplanes lower edge margins recessed from said collar portion lower end margin sufficiently to provide clearance with respect to the eye cornea outer surface when said collar portion lower end margin is pressed against the eye cornea outer surface;

said crossplanes intersection providing viewable alignment means for enabling a user, by grasping said handle, to visually align said central axis with the eye's optical center;

said handle being laterally disposed so as to provide firm hand control and manipulation of said collar portion and a clear field of vision of said collar portion, the eye cornea, and the eye's optical center.

4,705,036

HYGIENIC ATTACHMENTS FOR THERAPY LASERS

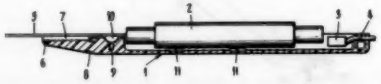
John L. Hughes; Frank E. Irons, both of Canberra, and George Kwiatkowski, Isabella Plains, all of Australia, assignors to Hughes Technology Pty Ltd., Fyshwick, Australia

Filed Dec. 6, 1985, Ser. No. 805,881

Claims priority, application Australia, Dec. 6, 1984, PG8453

Int. Cl.[4] A61B *17/36*

U.S. Cl. 128—303.1 **7 Claims**



1. A hand-held, laser therapy, laser beam generating system consisting of two detachable sections, said system consisting of two detachable sections, said system consisting of:

a main body containing the laser beam generator and terminated by a conically-shaped output end which has a bore extending along the long axis of said body, said bore having a diameter larger than the diameter of the laser beam generated so as to allow its direct, unhindered transmission out of said body which has a groove around the base of the said conical output tip positioned perpendicular to said axis, and

a hollow, conically-shaped, sterilizable and disposable end cap which fits over the conically-shaped output tip of said main body, said cap being attached to said main body when a simple rib on the inside surface of said cap slips into the said groove in the said conical output tip of the main body, said cap having a hollow tube protruding inwards from its tip which slips into the said hole in the tip of the main body in such a manner that allows for the unhindered transmission of the laser output beam while giving added protection against the contamination of the laser beam transmission channel inside the tip of the said main body, said disposable cap then providing protection for both patient and therapists against diseases being transmitted via the invention.

4,705,037

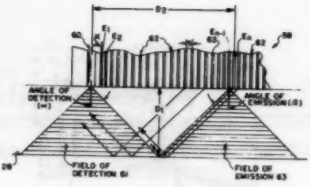
TOPOGRAPHICAL MAPPING, DEPTH MEASUREMENT, AND CUTTING SYSTEMS FOR PERFORMING RADIAL KERATOTOMY AND THE LIKE

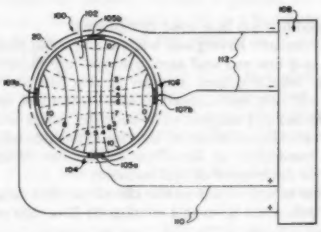
Gholam A. Peyman, 535 N. Michigan Ave. (Apt. 3001), Chicago, Ill. 60611, and James M. Grisolano, Jr., 1004 S. Monitor, Chicago, Ill. 60644

Filed Feb. 8, 1985, Ser. No. 699,682

Int. Cl.[4] A61F *17/32*

U.S. Cl. 128—305 **30 Claims**





1. A system for measuring the distance between a reference face and an energy reflecting surface comprising

at least one measurement unit including

means positioned adjacent to the reference face for emitting within a known angle of emission a cone of energy toward the reflecting face, and

means positioned on the reference face for detecting within a known angle of detection a cone of energy reflected from the reflecting face toward the reference face,

means for changing the lateral spacing between said emitter means and said detector means from a first interval, in which said emitter means and said detector means are generally adjacently spaced, to successive intervals, each increasing the lateral spacing between said emitter means and said detector means,

means for measuring the intensity of said cone of reflected energy detected by said detector means at said first interval and each of said successive intervals until the drop in intensity between two successive intervals exceeds a predetermined value,

means for determining the lateral distance between said emitter means and said detector means at which said drop in intensity occurs, and

means for calculating the distance between the reference face an the reflecting surface to the following formula:

$$D1 = \frac{\frac{1}{2} D2}{\text{Tan } \phi}$$

wherein D1 is the distance between the reference face and the reflecting surface,

wherein D2 is said lateral distance, and

wherein ϕ us the smaller of said angle of emission and said angle of detection.

19. A topographical mapping system for locating a position

on an electrical conducting surface or a surface that has been made electrically conductive for performing radial keratotomy and the like, said system comprising

a template peripherally defining an interior area and being sized to be adapted to be fitted upon the cornea of the eye and thus being attachable on the energy conducting surface to peripherally surround an area thereof, said template including

first means for generating a first known voltage gradient across the area surrounded by said template, and

second means for generating a second known voltage gradient across the area surrounded by said template, said second voltage gradient being non-parallel to said first voltage gradient,

a probe capable of being selectively positioned within the area surrounded by said template, said probe including means for sensing the voltage present at the energy conducting surface where said probe is positioned, and

system control means comprising

means for alternately energizing said first and second generating means on said template, and

means for creating an operator readable display of the voltage sensed by said probed sensing means, whereby the position of the probe relative to said first and second voltage gradient established on the electrical conducting surface surrounded by said template can be determined.

4,705,038

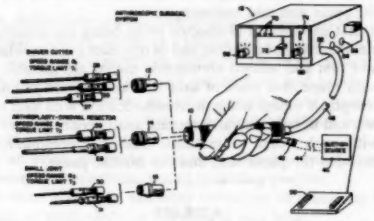
SURGICAL SYSTEM FOR POWERED INSTRUMENTS

Douglas D. Sjostrom, Wakefield, and Edvin Zemgals, Pinehurst, both of Mass., assignors to Dyonics, Inc., Andover, Mass.

Filed Jan. 23, 1985, Ser. No. 693,779

Int. Cl.[4] A61F *17/23*

U.S. Cl. 128—305 **10 Claims**



1. A surgical system adapted to operate a set of different surgical devices having different operational limits, comprising:

a handpiece adapted to alternately receive a proximal portion of each of said surgical devices,

said set of said surgical devices,

each of said surgical devices having an indicator on its proximal portion that denotes its operational limit,

said handpiece including automatic sensor means for sensing said indicator;

a motor for driving said handpiece; and

means responsive to said sensor to automatically establish the operational limit of said motor in accordance with the respective surgical device received by said handpiece.

4,705,039

SUBSIDIARY DEVICE FOR SUTURING AN INTESTINE

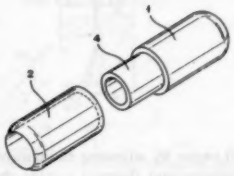
Ushio Sakaguchi; Masahiro Nakano, and Mitsukuni Uchida, all of Kumamoto, Japan, assignors to Takasago Medical Industry, Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1985, Ser. No. 759,416

Claims priority, application Japan, Jul. 28, 1984, 59-115180[U]

Int. Cl.[4] A61B *17/04*

U.S. Cl. 128—334 C **5 Claims**



1. An anastomotic device, comprising:

a first tubular member, formed as a hollow cylinder and having a smooth exterior wall, with a projecting member extending from an end thereof, said projection being cylindrical in shape and having an outer diameter smaller than the outer diameter of said first member; and

a second tubular member, formed as a hollow cylinder and having a smooth exterior wall, the inside diameter thereof defining a receiving portion dimensioned to accept said projection within the inside diameter of same;

said first and second tubular members being formed of a material soluble in an intestinal fluid;

whereby said first tubular member is inserted in one portion of an elongated object of anastomosis, said second tubular member is inserted in a second portion of said elongated object, and said first member projection is inserted into the receiving portion of said second member to stabilize said object for suturing;

wherein the material for forming said device is selected from the group consisting of gelatin, albumin, dextran, chitosan, pluran, hydroxypropylcellulose, hydroxypropylmethylcellulose, methylcellulose, carboxymethylcellulose, carboxymethylethylcellulose, polyvinyl alcohol, polyacrylamide, polyacrylic acid, polyethylene oxide and polyvinyl pyrrolidone; and

wherein the material is coated with a thin film of a water-soluble polymeric material selected from the group consisting of ethylcellulose and celluloseacetate.

4,705,040

PERCUTANEOUS FIXATION OF HOLLOW ORGANS

Peter R. Mueller, Lexington; Alan S. Brown, Boston; Marc J. Tolkoff, Brookline, all of Mass., and Frank B. Crawford, New Boston, N.H., assignors to Medi-Tech, Incorporated, Watertown, Mass.

Filed Nov. 18, 1985, Ser. No. 798,781

Int. Cl.[4] A61B *17/12*

U.S. Cl. 128—334 R **4 Claims**

1. A method for the fixation of a hollow organ of a living body to a body wall comprising:

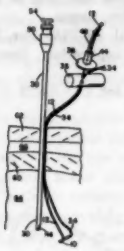
percutaneously inserting a rigid hollow needle carrying a retaining device attached to a trailing tension filament, through the skin, from outside the body, into said hollow organ in the manner that a portion of said trailing tension filament remains outside of the body,

said retaining device having a portion adapted to engage and apply pressure to an interior wall of said hollow organ,

releasing said retaining device within said hollow organ from said needle,

pulling a portion of said trailing tension filament from outside the body to draw said retaining device against the

interior wall of said hollow organ to pull said organ against the body wall, and



fixing said organ by adjusting the tension on said filament and clamping said filament outside the body by means bearing upon the exterior of the body.

4,705,041

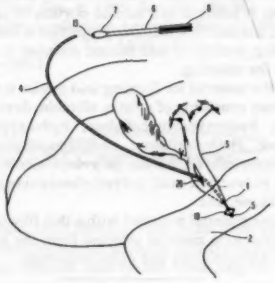
DILATOR FOR SPHINCTER OF ODDI

Il G. Kim, N. Main St., Hughesville, Pa. 17737

Continuation-in-part of Ser. No. 628,649, Jul. 6, 1984, abandoned. This application Sep. 19, 1986, Ser. No. 910,154

Int. Cl.[4] A61M *29/00*

U.S. Cl. 128—343 **8 Claims**



1. An apparatus for dilation of the Sphincter of Oddi comprising

a. a hollow cylindrical catheter at a diameter accommodatingly smaller than the Sphincter of Oddi;

b. a soft insertion tip member mounted on said catheter;

c. an expandible member mounted axially adjacent to said tip member and in communication with the interior of the catheter;

d. means for expanding said expandible

e. a series of hollow, flexible dilators of increasing outer diameter each with an inner diameter, said inner diameter accommodatingly larger than the outer diameter of the catheter, each dilator having an enlarged hollow tip portion on one end and a handle portion on the other end;

whereby dilation occurs by insertion of the catheter until the tip is in the desired location and subsequent insertion of the dilators one at a time stepwise in order of increased outer diameter coaxially over the catheter until the desired dilation is achieved whereupon the dilator and catheter apparatus is removed.

4,705,042

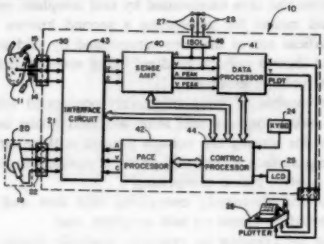
PACING SYSTEM ANALYZER HAVING PROVISION FOR DIRECT CONNECTION OF PACER TO PACING LEADS

Joel F. Giurtino, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed May 21, 1985, Ser. No. 736,635

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 PT **2 Claims**



1. A pacer system analyzer for verifying the operation of a cardiac pacing system including an implanted pacer lead and a cardiac pacer to be implanted, comprising:

a pacer system analyzer including an instrument housing;

first multi-contact connector receptacle means in said housing of one gender for establishing electrical communication between the pacer lead and said analyzer;

second multi-contact connector receptacle means in said housing of opposite gender from said first connector receptacle means for establishing electrical communication between the pacer and said analyzer;

first connector means for connection between the pacer lead and said first connector receptacle means and including a first multi-contact connector plug of opposite gender to and mating with said first connector receptacle means for establishing electrical communication between the pacer lead and said analyzer;

second connection means for connection between the pacer and said second connector receptacle means and including a second multi-contact connector plug of opposite gender to and mating with said second connector receptacle means for establishing electrical communication between the pacer and said analyzer; and

said first and second connector plugs being electrically and mechanically compatible and of opposite gender, whereby said first and second connection means are matable only with respective ones of said first and second connector receptacle means when in communication with said analyzer, and upon removal from said analyzer are connectable with each other to establish electrical communication between the pacer lead and the cardiac pacer.

4,705,043

ELECTROPHYSIOLOGY STUDY SYSTEM USING IMPLANTABLE CARDIOVERTER/PACER

Mir Imran, Gibsonia, Pa., assignor to Mieczslaw Mirowski, Owings Mills, Md.

Filed Jul. 5, 1985, Ser. No. 751,964

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 PG **10 Claims**

10. A system for conducting electrophysiology studies using an implantable pacer operable in the VVT mode comprising:

an implantable unit including,

a pacer operable in at least the VVT mode and having a trigger input;

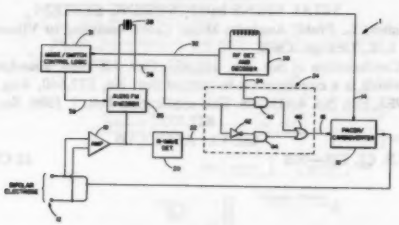
R-wave detecting means for detecting heart R-waves;

receiving means for receiving pulse command signals generated externally of the patient;

switching means for selectively connecting either the

R-wave detecting means or the receiving means to said trigger input of said pacer;

control means for controlling the switching means in accordance with mode control signals generated externally of the patient; and



an external unit including,

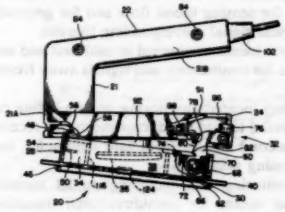
transmission means for transmitting pulse command signals and mode control signals to the implantable unit.

4,705,044

DEFIBRILLATOR PADDLE

James G. Deluhery, Madison, and Peter G. Truitt, Milton, both of Wis., assignors to Kone Instruments Inc., Milton, Wis.

Filed Nov. 12, 1985, Ser. No. 796,810
Int. Cl.[4] A61N *1/04, 1/36;* **H05G** *1/00*
U.S. Cl. 128—419 D **5 Claims**



1. A defibrillator paddle comprising in combination:

a paddle housing including a handle and a mounting portion;

an electrically conductive pediatric electrode attached to said mounting portion and spaced from said handle;

electrical circuit means including switch means mounted on said housing for applying a defibrillator shock signal to said pediatric electrode;

and an adult electrode assembly releasably attached in an assembled condition to said mounting portion;

said adult electrode assembly including an electrode base and an adult electode attached to said base;

said adult electrode having a surface area larger that the surface area of said pediatric electrode;

said pediatric electrode being nested inside of said adult electrode assembly in said assembled condition;

contact means carried by said adult electrode assembly for electrically connecting said pediatric electrode to said adult electrode in said assembled condition; and

a quick release latch engageable between said adult electrode assembly and said paddle housing including first and second interlocking elements on said mounting portion and said electrode base and further including a catch and a resiliently movable latch spaced from said first and second elements on mounting portion and said electrode base;

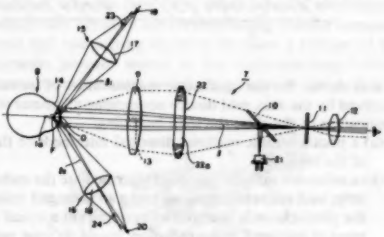
said latch including a lever mounted in said electrode base for pivotal movement and a spring for resiliently biasing said lever into engagement with said catch.

4,705,045

NON-CONTACT TYPE TONOMETER

Shinichi Nishimura, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1986, Ser. No. 832,763
Claims priority, application Japan, Feb. 26, 1985, 60-37237
Int. Cl.[4] A61B *3/16*
U.S. Cl. 128—648 **14 Claims**



1. A non-contact type tonometer having an orifice tube for discharging a fluid to deform a cornea of an eye under test, and an alignment optical system for aligning an axis of the orifice tube with the vertex of the cornea and for indicating a predetermined working-distance between a tip of the orifice tube and the vertex of the cornea, said alignment optical system comprising:

first projection means having a first optical axis thereof for projecting a first target image on the focal point of said cornea;

second projection means having a second optical axis thereof for projecting a second target image on the focal point of said cornea;

imaging optical means having a focal point and an alignment optical axis which is coaxial with said axis of said orifice tube for forming an image of specularly reflected light rays of said first and second projecting means from said cornea, said first and second optical axes of said projection means being obliquely arranged with respect to said alignment optical axis;

means for detecting said images formed by said imaging optical means;

said first and second projection means being configured such that said first and second optical axes and said alignment optical axis intersect with each other at a first intersection point on said alignment optical axis and said first and second projection means being further adapted to form said first and second target images at said intersection point; and

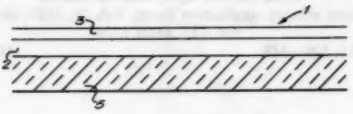
said tonometer being operable such that where no alignment error exists between the vertex of the cornea and the central axis of the orifice tube, and no working-distance error exists between the vertex of the cornea and the tip of the orifice tube, said first target light ray projected by said first projection means toward the cornea, and said second target light ray projected by said second projection means toward the cornea intersect at the focal point of the cornea, and a portion of the target light rays are reflected from the cornea and become parallel to said alignment optical axis of said imaging optical means, and said first and second reflected target light rays are imaged by said imaging optical means on said image detecting means and are coincident with each other at said focal point of said imaging optical means.

4,705,046

DEVICE FOR THE QUALITATIVE MEASUREMENT OF UV RADIATION RECEIVED BY THE SKIN

Jean J. A. Robillard, 28 Beechwood Road, Castletroy, Limerick, Ireland

Filed Jan. 16, 1986, Ser. No. 819,427
Int. Cl.[4] A61B 6/00
U.S. Cl. 128—665 **21 Claims**



1. A device for the qualitative measurement of uv radiation received by the skin, said device comprising a laminar strip for application to the skin, the strip including:

(a) a photochromic material disposed intermediate the ends of the strip; and

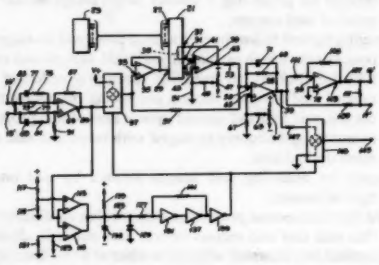
(b) a reference material disposed intermediate the ends of the strip; said reference material being so arranged relative to the photochromic material so as to permit a visual assessment of exposure to uv radiation, based, at least partially, on uv radiation reflected from the skin, by a direct comparison of the colour densities of the photochromic material and the reference material during exposure to sunlight.

4,705,047

OUTPUT CIRCUIT FOR PHYSIOLOGICAL MEASURING INSTRUMENTS

Wilber H. Bailey, San Diego, Calif., assignor to Camino Laboratories, Inc., San Diego, Calif.

Filed Sep. 30, 1985, Ser. No. 782,080
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—672 **12 Claims**



1. In combination with a digital physiological measuring instrument for generating a digital signal indicative of a physiological parameter to drive a monitor, wherein the monitor provides an excitation signal having predetermined characteristics and is responsive to a response signal having similar characteristics to generate a visual display representative of the physiological parameter, an improved output circuit for accepting the excitation signal and generating the response signal, the output circuit comprising:

scaling means responsive to the digital signal and to the excitation signal to generate a scaled signal having characteristics similar to those of the excitation signal and a magnitude proportional to the digital signal;

summing means responsive to the excitation signal and to the scaled signal to generate the response signal by subtracting from the scaled signal a portion of the excitation signal whereby the response signal is caused to assume a predetermined magnitude when the digital signal assumes a predetermined value;

means for applying the excitation signal to the scaling means; and

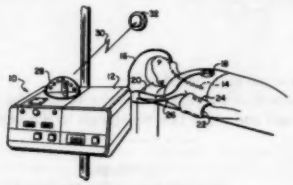
means for applying the response signal to the monitor for generating the visual display.

4,705,048

VITAL SIGNS MONITORING SYSTEM

Robert L. Pfohl, Anaheim Hills, Calif., assignor to Vitacomm, Ltd., Orange, Calif.

Continuation of Ser. No. 660,454, Oct. 12, 1984, abandoned, which is a continuation-in-part of Ser. No. 522,640, Aug. 11, 1983, Pat. No. 4,619,268. This application Feb. 7, 1986, Ser. No. 827,777
Int. Cl.[4] A61B 7/00
U.S. Cl. 128—715 **12 Claims**



1. A portable patient vital signs monitoring system comprising, in combination:

first sound sensing means to be attached to a patient's body for sensing heart and lung sounds and for generating a first electrical signal corresponding thereto;

second sound sensing means to be attached to a patient's body for sensing blood flow and for generating a second electrical signal corresponding thereto;

conductor means connected to said first and second sensing means for conducting said signals away from the patient's body;

a remotely located monitoring unit including control means connected to said conductor means for receiving said first and second signals from said conductor means and for processing said signals;

said monitoring unit including an IR transmitter having emitter means for omnidirectional transmission of said processed first and second signals; and

a remote portable, IR receiver to be worn on an operator's body for receiving said processed first and second signals and for converting said received signals into audible form.

4,705,049

INTRAOPERATIVE MONITORING OR EP EVALUATION SYSTEM UTILIZING AN AUTOMATIC ADAPTIVE SELF-OPTIMIZING DIGITAL COMB FILTER

Erwin R. John, 930 Greacen La., Mamaroneck, N.Y. 10543

Filed Aug. 4, 1986, Ser. No. 892,993
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—731 **7 Claims**

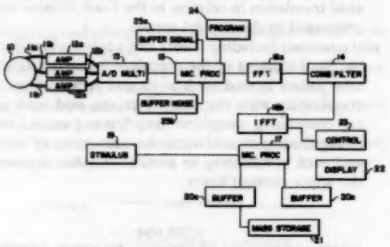
1. An electroencephalograph (EEG) system for the detection of a patient's brain waves, including:

a series of electrodes adapted to be connected to a plurality of sectors of the patient's head to produce analog signals representing the patient's brain waves; amplifier means connected to the electrodes, including low-noise high-gain amplifiers to amplify the analog signals; analog/digital conversion means connected to the amplifiers to produce sets of digital data corresponding to the patient's brain waves;

a digital filter means connected to said analog/digital conversion means to improve the signal-to-noise ratio of the digital data;

digital data analysis means connected to the filter means to analyze the data on a statistical basis to produce analyzed

data showing abnormalities and normalities in the brain waves; and display means to display the analyzed data; wherein said digital filter means is a digital comb filter which has self-optimizing means to automatically select the band



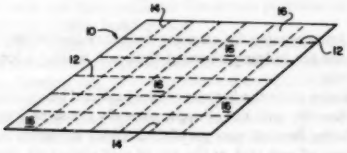
pass frequencies constituting the teeth of the comb filter based on a comparison, at each tooth, of the phase variance parameter of digital data in the brain state of the presence and the brain state of the absence of a synchronized stimulus producing an evoked potential brain wave.

4,705,050

MOISTURE-ACTIVATED FLOATATION DEVICE

Markham, Charles W., 667 Snug Island, Clearwater Beach, Fla. 33515

Filed Oct. 2, 1985, Ser. No. 783,157
Int. Cl.[4] A01F *5/441*
U.S. Cl. 128—749 **5 Claims**



1. A collection device to receive and support stool or feces for use with a toilet bowl to collect the stool or feces for medical testing; said collection device comprising a sheet of thin flexible material having a top and bottom side, said sheet of thin flexible material having a foam evolving compound adhered to said bottom side thereof such that when said collection device is placed within the toilet bowl, said foam evolving compound contacts the water within the toilet bowl forming a foam on said bottom side of said sheet of thin flexible material whereby said foam provides sufficient buoyancy to float said sheet of thin flexible material and the stool or feces thereon in floating relationship to the water within the toilet bowl to maintain the structural integrity of said sheet of thin flexible material and permit retrieval of the stool or feces supported on said top side of said sheet of thin flexible material for medical examination.

4,705,051

POWDERED COSMETIC CONTAINER

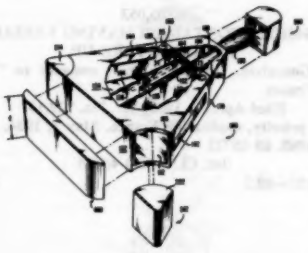
Rosemarie Bacon, and Kenneth Bacon, both of 2162 Hollywood Dr., Forked River, N.J. 08731

Filed Aug. 8, 1986, Ser. No. 894,652
Int. Cl.[4] A45D *40/00*
U.S. Cl. 132—79 A **11 Claims**

1. Apparatus for a cosmetic container useful for separately holding at least two cosmetic powders, for mixing a desired portion of each of said powders to form a mixed powder and for applying the mixed powder to a user's body, said apparatus comprising:

a container body having a top surface and a base, said container body also comprised of at least two separate closed holding compartments, each of which holds a corresponding one of said cosmetic powders, and a separate mixing chamber adjacently situated to each of said holding compartments;

at least two valves capable of being separately actuated by said user, each valve being located on a wall situated within said container body and separating a corresponding one of said holding compartments from said mixing chamber, wherein each valve when actuated establishes a passageway between the corresponding holding compartment and said mixing chamber to allow a portion of the cosmetic powder stored in the corresponding holding compartment to enter said mixing chamber and be mixed



therein with the cosmetic powders emanating from other ones of said holding compartments to form said mixed powder;

an arm located within said container body and capable of being moved by said user in a substantially vertical direction within said container body and between said base and said top surface;

an applicator for applying said mixed cosmetic powder to a user's body wherein said applicator is mounted to one end of said arm such that when said arm is moved to one end of its travel the applicator will substantially retract into said mixing chamber wherein the applicator can be coated with said mixed powder, and when said arm is at the other end of its travel said applicator will extend through both said mixing chamber and said top surface of said container body such that the applicator can be stroked against the user's body to transfer a portion of said mixed powder thereto.

4,705,052

HAIRSTYLING BRUSH AND A METHOD FOR HANDLING HAIRSTYLING BRUSHES

Jimmie D. Modin, 728 S. 10th, Salina, Kans. 67401

Continuation-in-part of Ser. No. 648,474, Sep. 10, 1984, Pat. No. 4,605,023. This application May 12, 1986, Ser. No. 861,841
Int. Cl.[4] A45D *44/18*
U.S. Cl. 132—85 **6 Claims**

1. A method for handling hairstyling brushes comprising the steps of:

(a) releasing an immovable boss means of a brush head means from within an aperture of a biasing latch means and from extending and operating through a slot of a generally cylindrical handle means that registers with said aperture and is open on one end, in order to separate the brush head means from the cylindrical handle means, said biasing latch means being secured at one end to the handle

means and generally on the same side of said handle means that has said slot; and

(b) positioning the brush head means in a sterilzing fluid contained in a reservoir container of a means for handling hairstyling brushes.

4,705,053

COSMETIC CONTAINER HAVING VARIABLE PRODUCT TAKE-UP

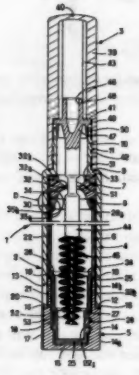
Antonin Goncalves, Groslay, France, assignor to "L'Oreal", Paris, France

Filed Apr. 30, 1985, Ser. No. 729,147

Claims priority, application France, May 7, 1984, 84 07059; Apr. 17, 1985, 85 05773

Int. Cl.[4] A45D *40/26*

U.S. Cl. 132—88.7 **23 Claims**



1. In a make up unit for dispensing eyelash make up comprising:

(a) a container for a fluid or pasty make up product, said container having an inlet;

(b) a detachable cap fitted on the container;

(c) a stem coaxial with said cap and having a proximal end integral with said cap, said stem projecting in relation to said cap;

(d) a brush carried by the distal end said stem as an extension of the said stem;

(e) a wiper element having a wiper lip made of an elastic material and disposed at the inlet of said container into which said brush enters, said wiper element including means defining a passage delimited by the inner edge of the wiper lip, said passage having a smaller cross-section than the cross-section of the brush in the undeformed state of the brush;

the improvment wherein said wiper element further includes a ring made of an elastic material joined to the periphery of the wiper lip, said ring having a greater thickness than said lip, and wherein said wiper element is capable of sustaining an elastic deformation leading to a variation of cross-section of the passage under the actuation of control means which varies the axial compression of said elastic ring;

said container being constituted by a movable element and a fixed element between which said ring of the wiper element is interposed, the movable element being capable of axial translation in relation to the fixed element and being connected to the control means;

said container including a neck and a tube formed therewith, the fixed element of the container being constituted by a tube joined to said neck at its end remote from the end cooperating with the control means, said neck and said cap comprising complementary first and second means for fitting the cap on said neck, the connection of said tube to said neck constituting an annular shoulder against which the wiper element bears.

4,705,054

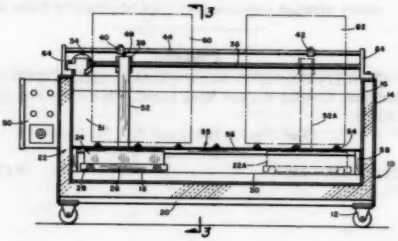
ULTRASONIC RADIATOR CLEANING SYSTEM

John T. Fields, 810 E. 6th St., Tulsa, Okla. 74120

Filed Aug. 15, 1985, Ser. No. 765,847

Int. Cl.[4] B08B *3/12*

U.S. Cl. 134—57 R **3 Claims**



1. An apparatus for cleaning radiators comprising:

a tank for holding cleaning fluid and having a longitudinal axis;

a sludge pit in the bottom of said tank and being of less width than the tank but of approximately the same length, there being formed two parallel shoulder members in the bottom of said tank at the top of said sludge pit, there is one such shoulder member on each side of said sludge pit;

a radiator rack supported above the bottom of said tank and extending the full length thereof and extending over substantially all of the sludge pit;

a roller on each of said shoulders;

carriage means supported by said rollers, said carriage means supporting an energy source over said sludge pit;

means for automatically moving said carrier means and said energy source between two selected positions along a path on said shoulders within said container.

4,705,055

APPARATUS FOR AUTOMATICALLY CLEANING EXTRUSION SCREENS IN JUICE FINISHING MACHINES AND THE LIKE

Robert F. Rohm, Yorba Linda, and Ronald C. Bushman, Hacienda Heights, both of Calif., assignors to Brown International Corporation, Covina, Calif.

Continuation-in-part of Ser. No. 747,454, Jun. 21, 1985, abandoned. This application Nov. 27, 1985, Ser. No. 802,427

Int. Cl.[4] B08B *3/02, 9/00*

U.S. Cl. 134—57 R **8 Claims**

1. Cleaning apparatus for finishing machines of a type having a generally cylindrical perforated screen arranged in a housing, inlet means for introducing juice or the like laden with solids into the interior of the screen, means for urging the solids-laden juice against the screen with first outlet means outside the

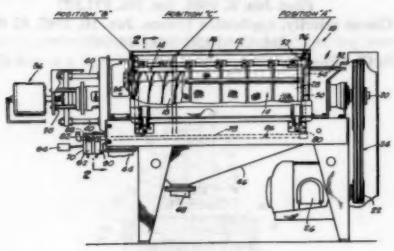
screen for receiving finished juice passing through the perforated screen and second outlet means for receiving solids retained within the interior of the screen and separated from the finished juice, portions of the screen adjacent the second outlet means being subject to increased solids buildup, comprising:

a cleaning ring including spray nozzles arranged circumferentially about the screen,

means mounting the cleaning ring for reciprocating movement back and forth along the axis of the screen,

reversing motor means for driving the cleaning ring back and forth along the screen,

means for initiating operation of the motor means to commence a cleaning operation,



first limit switch means operatively coupled with the motor means and comprising means for sensing movement of the cleaning ring toward an axial end of the screen adjacent the second outlet means, the first limit switch means being operable for reversing operation of the motor means,

control means for causing the cleaning ring to automatically cycle back and forth adjacent the screen portions subject to increased solids buildup, and

second limit switch means operatively coupled with the motor means and comprising means for sensing movement of the cleaning ring toward a selected end position of the screen opposite the second outlet means, the second limit switch means being operable for terminating operation of the motor means with the cleaning ring in the selected end position.

4,705,056

DESTAINING APPARATUS FOR ELECTROPHORESIS GELS

Daniel Y. M. Chu, San Francisco, Calif., assignor to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed Sep. 20, 1984, Ser. No. 653,393

Int. Cl.[4] B08B *3/04*

U.S. Cl. 134—111 **4 Claims**

1. Apparatus for destaining a plurality of electrophoresis gels, said apparatus comprising:

(a) a stack of gel support trays, each of said trays comprising a member independently selected from the group consisting of:

(1) a tray for supporting a plurality of gel tubes, comprising:

four raised sides and a flat base having an elongate opening along one of said sides;

a fluid-penetrable gel-supporting horizontal partition dividing the interior of said tray into upper and lower portions;

a plurality of non-fluid-penetrable vertical partitions dividing said upper portion into a plurality of troughs parallel to said elongate opening, each trough sized to receive approximately one tube gel; and

a plurality of baffles in said lower portion parallel to and in staggered relation with said vertical partitions to define an undulated fluid flow path passing through said tube gels and down through said elongate opening; and

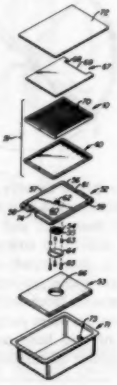
(2) a tray for supporting a gel slab, comprising:

four raised sides and a flat base having an elongate opening along one of said sides; and

means for retaining a gel slab on said base clear of said elongate opening with substantially no obstruction to fluid flow across said base toward said opening;

(b) means for interlocking said trays in said stack to substantially prevent lateral slippage;

(c) means on each tray in said stack for guiding the stacking thereof such that said elongate openings in all adjacent pairs of trays are at opposite sides of said stack;



(d) a cover plate to partially enclose the top tray in said stack leaving an elongate opening along the side opposite that of the elongate opening in said top tray;

(e) a filter capable of absorbing gel stain from a destaining fluid;

(f) means for guiding fluid flow leaving the elongate opening of the bottom tray of said stack through said filter;

(g) a tank for retaining destaining fluid and for receiving said tray stack, cover plate, filter and fluid flow guide means submerged in said fluid; and

(h) means for circulating fluid down through said tray stack, through said fluid flow guide means and said filter and up the exterior of said stack to re-enter said stack through the elongate opening of said cover plate.

4,705,057

CLEANING DEVICE FOR REGENERATIVE HEAT EXCHANGERS

Karl-Heinz Mohr, Ratingen, and Manfred Tratz, Mülheim, both of Fed. Rep. of Germany, assignors to Balcke-Dürr Aktiengesellschaft, Ratingen, Fed. Rep. of Germany

Filed Jun. 27, 1985, Ser. No. 749,298

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1984, 3423619

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—180 **6 Claims**

1. A device for cleaning heat-exchanging surfaces of a stationary storage medium of a regenerative heat exchanger which has a rotatably driven hood via a cleaning fluid which is discharged from at least one spray nozzle essentially parallel to the planes of said heat-exchanging surfaces; said at least one spray nozzle is movable relative to said storage medium; the improvement therewith which comprises:

an at least two-part, telscopic nozzle holder, which is mounted on said rotatably driven hood of said heat exchanger; said at least one spray nozzle being disposed at one end of said telescopic nozzle holder;

a supply line connected to said nozzle holder; and

a transfer mechanism connected to a source of said cleaning fluid and to said supply line to furnish said cleaning fluid to said nozzle holder; said transfer mechanism being disposed in a location coinciding substantially with center of rotation of said hood, and includes a tubular piece, which rotates with said hood, and a stationary housing which is sealed off relative to said tubular piece and is connected to said source of oleaning fluid; said nozzle holder essentially

comprising two parts, namely a base part which is attached to said hood, and a movable part which is movable relative to said base part and which movably projects relative to the stationary storage medium such that the cleaning fluid is discharged onto the heat-exchanging surface which are to be subjected to cleaning; an end of said base part remote from said at least one spray nozzle being disposed on the outer periphery of said hood, and an oppposite end of said base part being disposed in the vicinity of the center of rotation of said hood.

4,705,058

PLUG VALVE

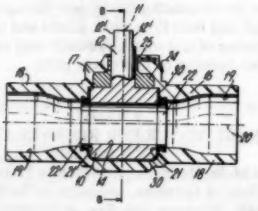
David S. Marklew, Walsall, England, assignor to Glynwed Tubes and Fittings Limited, Cannock, England

Filed Jun. 2, 1986, Ser. No. 869,415

Claims priority, application United Kingdom, Jun. 3, 1985, 8513925

Int. Cl.⁴ F16K *5/04*

U.S. Cl. 137—15 **3 Claims**



1. A method of manufacturing a plug valve including the steps of: providing a plug with a passage therethrough and a stem extending therefrom along an axis transverse to said passage, providing a metal can of a form to receive said plug as a close rotatable fit to permit rotation of the plug in the can about said axis, the can having, in the wall thereof, ports for registration with said passage in the plug, said stem being of reduced diameter with respect to said plug, inserting said plug in said can, moulding plastics material, in a liquid or plastic condition around said plug and can to form, after solidification of the plastics material, a body of said plastics material surrounding said plug and can and embracing said stem, with the spindle projecting from said body, said body having a passage therethrough which is in register with said ports in the can and which in one rotational position of the plug about said axis is in register with said passage in the plug and in another rotational position of said plug is blocked by the plug.

4,705,059

ELECTROFLUIDIC TRANSDUCER OF THE NOZZLE/PLATE TYPE AND HYDRAULIC SERVO-VALVE EQUIPPED WITH SUCH A TRANSDUCER

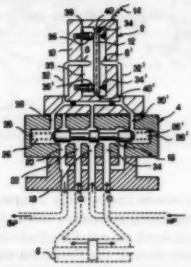
Jean-Pierre Lecerf, Creil; Charles Favey, Gouvieux, and Pierre Meurice, Le Blanc-Mesnil, all of France, assignors to Centre Technique des Industries Mecaniques, Senlis, France

Filed Jun. 6, 1986, Ser. No. 871,327

Claims priority, application France, Jun. 10, 1985, 85 08713

Int. Cl.⁴ F15B *5/00, 13/043*

U.S. Cl. 137—82 **6 Claims**



1. An electrofluidic transducer, having at least one nozzle and a movable plate, in which said movable plate consists of a piezoelectric double-layer strip, at least one of the faces of which interacts directly with at least one nozzle to control the flow rate from said at least one nozzle as a function of the deformations of said double-layer strip which are caused by electrical signals, said piezoelectric strip being held in position opposite said at least one nozzle by supporting members acting on the two opposing faces of said strip and located in the vicinity of the edges of said strip, in which transducer the supporting members are in substantially point contact with the faces of said strip, said supporting members being arranged in pairs opposite one another on the two opposing faces of said strip, the supporting members located on one of the faces of said strip being fixed rigid supports, the supporting members located on the other face of said strip being movable in at least one direction perpendicular to the faces of said strip, and said supporting members forming, in pairs, knuckle-type pivots allowing the free natural deformation of said strip over its entire surface under the effect of said electrical signals.

4,705,060

DETECTING LEAKS IN PLUMBING SYSTEMS

Stephen Goulbourne, 28 Holt House, Tulse Hill, London, United Kingdom

Filed Feb. 2, 1987, Ser. No. 9,693

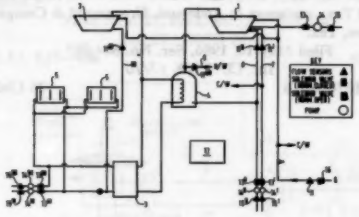
Claims priority, application United Kingdom, Aug. 1, 1986, 8618802

Int. Cl.⁴ F17D *5/02*

U.S. Cl. 137—102 **10 Claims**

1. Apparatus for dealing with a leak in a plumbing system, comprising flow sensor means for detecting any unauthorised flow of water in said plumbing system, valve means for closing

down the leaking part of said system, means for ejecting water from the leaking part of said system to a drain, and control



means for controlling said valve means and said ejecting means in response to a signal received from said flow sensor means.

4,705,061

DRIVE MECHANISM FOR A VALVE

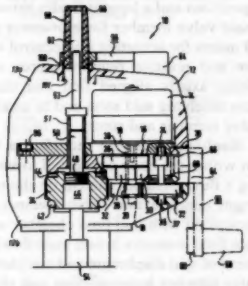
Fritz Mueller, Neuer Wasen 6, 7118 Ingelfingen-Criesbach, and Lothar Pienta, Teichstrasse 17, 7118 Ingelfingen 2, both of Fed. Rep. of Germany

Filed May 19, 1986, Ser. No. 864,784

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1985, 3520502

Int. Cl.[4] F16K *31/60, 31/05*

U.S. Cl. 137—269 **7 Claims**



1. A drive mechanism for a spindle of a valve, comprising:
a housing accommodating said spindle defining an axis;
an electromotor;
a gear transmission cooperating with said electromotor for actuating said spindle, said electromotor and said gear transmission being arranged within said housing at a distance to said axis of said spindle so that said spindle is axially movable without any interference by said electromotor and said gear transmission and adjustable to arbitrary strokes;
and actuating means for manually driving said gear transmission and including a hand crank attachable to said housing to act on said gear transmission for driving the latter upon rotating said hand crank, said hand crank being provided with a grip which is made of translucent material to serve as viewing glass for allowing to monitor the position of said spindle.

4,705,062

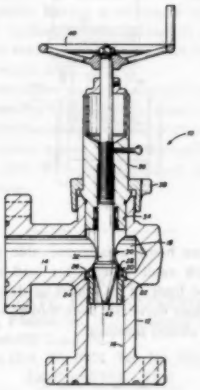
CHOKE AND IMPROVED NEEDLE TIP THEREFOR

Gerald S. Baker, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Feb. 18, 1987, Ser. No. 16,130

Int. Cl.[4] F16K *43/00, 51/00*

U.S. Cl. 137—315 **12 Claims**



1. A choke comprising
a body having an internal valve chamber with an inlet and an outlet communicating through the body into the valve chamber,
a seat positioned within said valve chamber surrounding the opening of the outlet into the valve chamber,
a valve member positioned within said valve chamber and including a stem and a replaceable wear-resistant tip,
means connected to said stem to move said stem and said tip toward and away from said seat to control flow therethrough,
said stem being threaded on its end for fastening to said tip,
said tip having an internal cylindrical recess with an annular groove in the surface of said recess, and
a sleeve slidably inserted into said recess and having internal threads mating with the threads on the stem and having a shank, a portion of which is swaged into the groove in said recess to secure said sleeve insert within said recess and the remaining portion of the shank being postioned in said recess.

4,705,063

MOTOR OPERATED VALVE ASSEMBLY

James L. Robinson, Florence, Ky., assignor to The Fulflo Specialties Co., Inc., Blanchester, Ohio

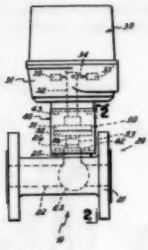
Filed Oct. 30, 1986, Ser. No. 924,792

Int. Cl.[4] F16K *31/04, 5/08*

U.S. Cl. 137—315 **7 Claims**

1. A motor operated valve assembly comprising:
a valve housing
a rotatable valve contained within said housing, said valve being movable between a fully open and a fully closed position,
a valve stem carried by said rotatable valve and extending from said housing,
a bracket rigidly mounted on said valve housing,
a motor rigidly mounted to said bracket and having a rotatable output shaft extending toward and in axial alignment with said valve stem, said motor having a motor housing and switches contained internally of said motor housing for delineating the fully open and fully closed position of said valve, and

a coupling having an axis in axial alignment with said shaft and having first and second pieces both axially adjustable and angularly adjustable with respect to each other, said first piece being drivably connected to said shaft and said second piece being drivably connected to said stem, said



coupling pieces being axially movable into driving engagement with each other after said motor has been moved to one limit of its travel as determined by said switches and said valve has been moved to one of its fully open or fully closed positions.

4,705,064

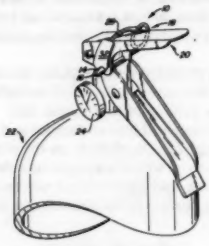
SAFETY SEAL FOR AN OPERATING LEVER

Freddy Self, 933 Parkside Dr., Richmond, Calif. 94803

Filed Aug. 12, 1986, Ser. No. 895,794

Int. Cl.[4] F16K *35/00*; A62C *23/10*

U.S. Cl. 137—384 **4 Claims**



1. A safety seal for an operating lever and a pin preventing operation of the lever, the lever pin including a shaft portion and a gripping portion connected thereto, the shaft and gripping portions of the lever pin extending to one and another sides of the lever, respectively comprising:

a. a cap, said cap being capable of covering the end of the shaft portion of the lever pin extending to one side of the lever, said cap frictionally engaging the end of the of the shaft portion of the lever pin sufficiently to prevent disengaging under gravitational force, but to allow disengagement by normal manual force; and

b. a tether connected to said cap and extending to the gripping portion of the lever pin extending to the another side of the lever, said tether being connected to the gripping portion of the lever pin, said tether possessing sufficient length to permit removal of said cap from the end of the shaft portion of the lever pin with the lever pin in place in the lever.

4,705,065

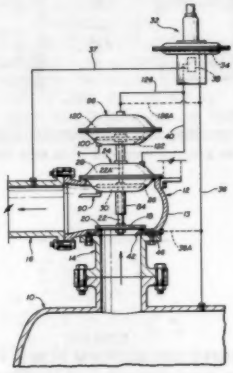
SAFETY RELIEF SYSTEM FOR CONTROL OR VENT VALVES

Michael D. McNeely, Katy, and Walter W. Powell, Sugar Land, both of Tex., assignors to Anderson, Greenwood & Company, Houston, Tex.

Filed May 16, 1986, Ser. No. 864,083

Int. Cl.[4] F16K *17/10*

U.S. Cl. 137—484.6 **26 Claims**



1. In a safety relief system for a tank having a main flowline connected to the tank and a control valve in the main flowline adapted to open under a predetermined negative fluid pressure within the tank to permit a flow of fluid to the tank and to open under a predetermined positive fluid pressure within the tank to permit a flow of fluid from the tank, the control valve having a valve member in the flowline movable between open and closed positions and a longitudinally extending valve stem secured to said valve member for movement therewith;

improved means for actuating said control valve under both negative and positive fluid pressures within said tank comprising axially aligned first and second diaphragm actuators receiving said stem and in axial alignment with said valve member and stem;

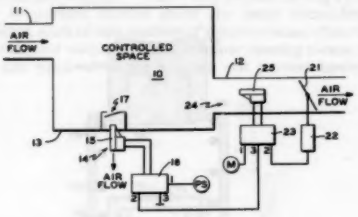
said first diaphragm actuator including a body and a diaphragm within the body connected to said valve stem for defining a fluid chamber therein on the outer side of said diaphragm opposite said valve member, means in fluid communication with said fluid chamber and responsive to upstream fluid pressures in said main flowline for effecting movement of said diaphragm and associated movement of said valve member between open and closed positions in response to changes in said upstream and downstream fluid pressures; and

said second diaphragm actuator connected to said valve stem outwardly of said first diaphragm actuator including a body and a second diaphragm within the body defining a vacuum fluid chamber therein on the outer side of said second diaphragm, said stem being connected to said second diaphragm for longitudinal movement relative to said second diaphragm in one direction of travel and for longitudinal movement with said second diaphragm in an opposite direction of travel, means in fluid communication with said vacuum fluid chamber on said outer side of said second diaphragm and responsive to a negative fluid pressure in said main flowline for effecting movement of said second diaphragm in said opposite direction of travel, said second diaphragm being operatively connected to said stem for moving said stem therewith for opening of said valve member under said negative fluid pressure.

4,705,066
SPACE STATIC PRESSURE CONTROL

Edward B. Gut, Morton Grove, and Mario M. V. Orrico, Chicago, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 27, 1981, Ser. No. 325,514
Int. Cl.[4] G05D *16/00*
U.S. Cl. 137—486 **11 Claims**



1. A system for controlling the static pressure within a space, said controlled space having duct means for moving air through said controlled space, said system comprising:

air flow sensor means mounted to sense air moving through a hole in a wall of said controlled space;

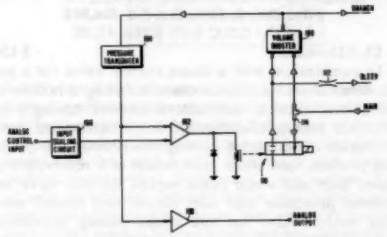
a check valve associated with said air flow sensor means for allowing air flow past said air flow sensor means in only one direction; and,

air flow control means connected to said air flow sensor means and responsive thereto for controlling static pressure within said controlled space.

4,705,067
ELECTRIC-TO-PRESSURE TRANSDUCER

Curtis L. Coffee, 2815 Plaza Dr., Apt. A, Indianapolis, Ind. 46268

Filed May 13, 1986, Ser. No. 862,760
Int. Cl.[4] G05D *10/00*
U.S. Cl. 137—487.5 **11 Claims**



1. A linear electric-to-pressure transducer, comprising:

a printed-circuit board substrate;

a manifold mounted on said substrate, said manifold defining inlet and outlet fluid lines, said inlet fluid line having a first terminating port for connection to a fluid source and further having a second terminating port, said outlet fluid line having a third terminating port for connection to an output device and further having fourth, fifth and sixth terminating ports;

a two-way solenoid valve mounted on said manifold, said valve including first and second ports directly sealingly engaging said second and fourth terminating ports, respectively, in said manifold;

a restrictor having one end sealingly engaged in said fifth terminating port in said manifold; and

closed-loop control means for operating said two-way solenoid valve as a linear variable orifice, said control means including

a miniature pressure sensor, said pressure sensor having a pressure port directly sealingly engaging said sixth terminating port in said manifold, said pressure sensor further including an electrical output;

input scaling means mounted on said substrate for scaling an electrical command signal;

a forward amplifier mounted on said substrate, said forward amplifier having a reference input connected to said input scaling means, an output connected to the solenoid in said solenoid valve, and further including a feedback input; and

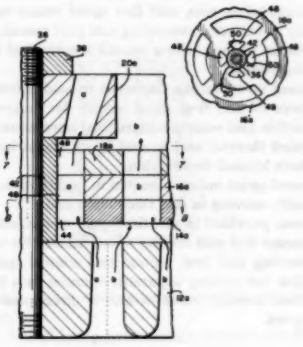
a feedback amplifier mounted on said substrate and connected between said pressure sensor electrical output and said feedback input of said forward amplifier,

said input scaling means, forward amplifier and feedback amplifier each including a printed circuit portion on said substrate.

4,705,068
PORTED-PLATE, FLUID CONTROL VALVE

Kevin Hartshorn, Plainsboro, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Oct. 27, 1986, Ser. No. 923,414
Int. Cl.[4] F16K *15/08*
U.S. Cl. 137—512.1 **7 Claims**



7. A ported-plate, fluid-control valve, comprising:

a ported valve seat;

a stop plate;

means coupling said seat and plate together, in parallel, and spaced apart; and

a plate-type valving element interpositioned between said seat and plate; wherein

said seat, plate and element comprise (a) first means defining a first fluid inlet zone, a second fluid outlet zone, and a plurality of discrete, fluid-conducting zones intermediate said first and second zones, and (b) second means for effecting a substantially smooth flow of fluid through said zones; further including

a guide ring interpositioned between said seat and said stop plate; and

a buffer plate movably interpositioned between said seat and said stop plate; wherein

said buffer plate has a plurality of limbs extending therefrom radially; and

said limbs are slidably and pilotingly engaged with said guide ring.

4,705,069

DIRECTIONAL CONTROL VALVE HAVING A BUILT-IN FLOW CONTROL VALVE

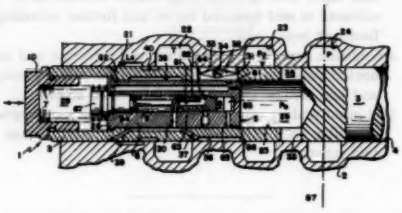
Günter Fertig, Wertheim, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Dec. 23, 1985, Ser. No. 812,325

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1984, 3446945

Int. Cl.[4] F15B *13/04*

U.S. Cl. 137—596 **18 Claims**



1. An integral valving apparatus comprising:

a valving apparatus housing, formed with a first longitudinal bore extending within said housing;

at least first and second port means disposed in said valving apparatus housing, for providing a fluid communication with said first longitudinal bore;

first spool means, mounted in said first longitudinal bore, for reciprocally moving within said first bore when a force is supplied thereto, said first spool means including means for selectively connecting said port means, said first spool means formed with a second longitudinal bore extending therewithin;

second spool means, mounted in said second longitudinal bore of said first spool means, for reciprocally moving within said second longitudinal bore when a force is supplied thereto, said second spool means including a third bore located therewithin;

control spool means mounted in said third bore for reciprocally moving in said third bore; and

means, provided in said first spool means, said second spool means and said control spool means, for selectively connecting said first, second and control spool means such that the valving apparatus operates as a pilot controlled flow control valve within a directional control valve spool.

4,705,070

ISOLATION ON/OFF VALVE

Paul G. Eidsmore, 2 Blue Hill Ct., Scotts Valley, Calif. 95066

Continuation-in-part of Ser. No. 826,022, Feb. 4, 1986, which is a continuation-in-part of Ser. No. 675,825, Nov. 28, 1984, Pat. No. 4,624,443, which is a continuation-in-part of Ser. No. 398,845, Jul. 16, 1982, abandoned. This application Dec. 10, 1986, Ser. No. 940,037

Int. Cl.[4] F16K *31/08*

U.S. Cl. 137—614.21 **17 Claims**

1. A valve comprising:

a valve body having a fluid inlet and fluid outlet in selective communication with one another through an aperture;

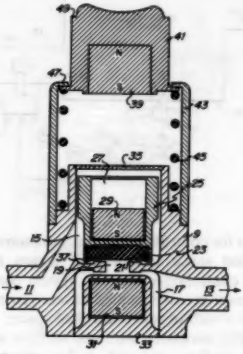
a first channel operatively associated with one of said fluid inlet and fluid outlet on a first side of said aperture;

a second channel operatively associated with the other of said fluid inlet and fluid outlet on a second side of said aperture;

a first valve member received in said first channel, said first valve member including a seal face having an outwardly extending generally domed surface adapted for selective closing engagement with said aperture;

a chamber having a first predetermined dimension defined in said first valve member;

a first magnet of a second predetermined dimension received in said chamber, said second dimension being substantially less than said first dimension such that said first magnet can move within said chamber between first and second positions corresponding to open and closed positions of said first valve member;



a second magnet disposed in said second channel magnetically urging said first magnet to one of said first and second positions; and,

magnet means remotely disposed from said first and second channels for magnetically urging said first magnet to the other of said first and second positions.

4,705,071

STEAM CONTROL VALVE WITH IMPROVED MUFFLER PORTION

Herman J. Connors, Jr., Monroeville, and Francis A. Kramer, Hampton Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 9, 1985, Ser. No. 806,568

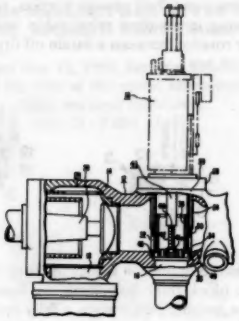
Int. Cl.[4] G21C *9/00*; **F16K** *47/00*

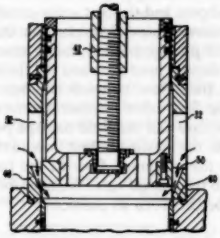
U.S. Cl. 137—625.3 **3 Claims**

1. In combination with a steam control valve for a power plant steam chest, said steam chest including a hollow elongated central member, said central member having a steam inlet means passing therethrough in predetermined position and a steam outlet means passing therethrough in predetermined position, said steam inlet means at a relatively higher pressure than said steam outlet means, throttle valve means positioned proximate said inlet means, said central member having control valve aperture means passing therethrough, said steam control valve including a cylindrical outer housing means having a lip member affixed to the upper end thereof, said lip member having an outside diameter greater than said control valve aperture, said outer housing means passing through said control valve aperture and maintained in predetermined position by said lip member, said outer housing means including a bottom muffler portion, said bottom muffler portion having window opening means of predetermined dimensions therethrough and spaced about the circumference thereof, the bottoms of said window opening means a predetermined distance above the bottom of said bottom muffler portion, said bottom muffler portion of said outer housing having an initial inside diameter greater than the final inside diameter of the remaining portion of said outer housing, a movable plug for controllably sealing said high pressure inlet means from said relatively low pressure outlet means, said movable plug coaxially aligned with said outer housing means and slidable within the interior of said housing means, shaft means for

moving said plug at one end affixed to said plug in predetermined position, lifting means affixed to the other end of said shaft means for lifting said plug, said plug having groove means therein about the circumference thereof in predetermined position, circular seal ring means sized to be insertable into said groove means, the improvement which comprises:

a bottom ring portion disposed between the bottom of said window opening means and the bottom of said bottom muffler portion, said window ring portion having a plurality of pockets therein about the inner circumference thereof, each of said pockets of predetermined dimensions and aligned with one of said window opening means, each of said pockets having a steam exit portion having an initial central diameter equal to the inside diameter of the bottom muffler portion of said outer housing and each of said pockets having a final central diameter at the steam entrance portion of said pocket a predetermined amount larger than the initial central diameter of said steam exit portion of said pocket, the steam entrance portion of each of said pockets are disposed within said bottom of said aligned window opening means, said steam exit portion of each of said pockets being a predetermined distance above the bottom of said outer housing, whereby when said plug is initially lifted by said lifting means, steam at said high pressure inlet means flows through said window opening means and through said pockets without damaging vibration of said outer housing means and plug.





4,705,072

SINGLE-LEVER MIXING FIXTURE

Werner Egli, Egliswil, Switzerland, assignor to Armaturenfabrik Wallisellen AG, Wallisellen, Switzerland

Filed Feb. 6, 1987, Ser. No. 11,565
Claims priority, application Switzerland, Feb. 7, 1986, 497/86
Int. Cl.⁴ F16K *11/078*
U.S. Cl. 137—625.17 **10 Claims**

1. A single-lever mixing fixture, comprising:

(a) a solid disc (22) stationarily disposed in a housing (32),

(b) a plurality of through openings (23,24,25) defined in said disc for the inflow of cold and hot water and for the discharge of mixed water,

(c) a control disc (20) rotatable and laterally displaceable relative to the solid disc and disposed in sliding engagement therewith,

(d) a control edge (26) defined at a recess (27) in the control disc, said recess serving to connect the through openings,

(e) a connecting piece (18) for transmitting rotary and lateral displacement movement from an actuating member (3) to the control disc (20),

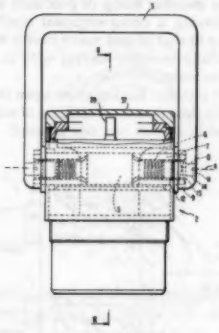
(f) a radial through bore (46) in a guide member (43) for accommodating a control shaft (5) for pivoting the control disc (20) via the connecting piece by means of a control pin (15), said guide member being rotatably disposed in the housing,

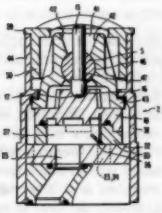
(g) the control shaft being cylindrically formed and having opposite ends projecting outwardly at least as far as the circumference of the housing,

(h) the control pin being inserted rigidly through a radial bore (47) in the control shaft,

(i) the connecting piece (18) being in rotationally rigid engagement with the guide member (43) for transmitting the rotary movement and in radially displaceable engagement with the guide member for transmitting the lateral displacement movement, and

(j) a recess (17) defined in the connecting piece for engagement with one end of the control pin (15).





4,705,073

MOLDED PLASTIC GATE VALVE AND SEALING MEANS THEREFOR

Blaine E. Beck, Peachtree City, Ga., assignor to Advanced Medical Devices, Inc., Dover, Del.

Filed Apr. 23, 1986, Ser. No. 854,829
Int. Cl.⁴ F16K *11/06*
U.S. Cl. 137—625.25 **7 Claims**

1. In an oxygenation/suctioning valve or the like of the type comprising a molded plastic valve body having oxygenation

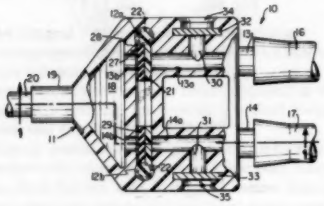
and suctioning port means at one side and catheterization port means on an opposite side thereof, a plastic valve member bi-directionally movable in said valve body between limit positions and having valve passage means therein for selectively connecting said catheterization port means to said oxygenation, in one limit position, and to said suctioning port means, in the other limit position, the improvement characterized by

(a) said valve body being of precision molded construction and having an open valve cavity formed therein for the movable reception of said valve member,

(b) said oxygenation and suctioning port means opening into said valve cavity at one side, and said catheterization port means opening into said valve cavity at the other side,

(c) said valve member being of precision molded construction and having a cross sectional configuration closely conforming to that of said valve cavity while being freely bi-directionally movable therein with at least a minimum positive clearance,

(d) said valve member having an an open recess of predetermined depth, less than the thickness of said valve member, and formed in at least one side thereof,



(e) a resilient valve seal member received in said recess and projecting outward therefrom, and having an outer surface of low friction material,

(f) said resilient seal member having a thickness, greater than the depth of said recess, such that, within normal precision molding tolerance limits of said valve cavity and said valve member, said seal member will be held under at least some compression within said recess,

(g) said valve member and seal member having passage means therein, within the area of said recess, for alternatively connecting said oxygenation or suctioning port means with said catheterization port means, and

(h) said valve member and said valve body having cooperating limit stop means for limiting the bi-directional movements of the valve member and defining said limit positions,

(i) said seal-receiving and said seal extending over an area of said valve member such that at least a portion of said seal is positioned opposite said oxygenation and suctioning port means in either limit position of said valve member.

4,705,074
MIXER TAP

Per I. Olsson, and Yngve G. Sedwall, both of Mjölby, Sweden, assignors to Danfoss A/S, Nordborg, Denmark

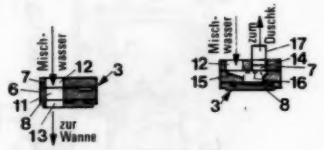
Continuation of Ser. No. 585,433, Mar. 2, 1984, abandoned, which is a continuation of Ser. No. 364,467, Apr. 10, 1982, abandoned. This application Jun. 10, 1986, Ser. No. 872,634

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1981, 3113653

Int. Cl.[4] F16K *11/074*

U.S. Cl. 137—625.46 **6 Claims**

1. A shower and bath mixing valve adapted for directing the flow of water to a shower head and alternately for a bath, comprising, a housing having an inlet port, a shower head outlet port adapted for connection to a shower head, and a bath outlet port, a first valve member joined to the housing in fixed relationship to the housing and having an inlet first aperture extending therethrough in fluid communication with the inlet port and an outlet aperture extending therethrough and in fluid communication with the shower head port, a second valve member rotatably mounted in the housing and having an aperture extending therethrough that is adapted to fluidly connect the first valve member inlet aperture to the bath port, a fluid passage portion adapted to fluidly connect the first valve member inlet aperture to the shower head port and a fluid flow blocking portion adapted to block fluid flow between the first valve member inlet aperture and both of the second valve member aperture and fluid passage portion and selectively block fluid flow from the first valve member inlet aperture to the respective one of the second valve member second aperture and fluid passage portion, and being mounted in the housing in abutting relationship with the first valve member for rotation between a datum off first position that the



fluid flow blocking portion blocks the first valve member first aperture to block fluid flow from the housing inlet port to either of the housing outlet ports, a fully open bath flow position that the second valve member aperture fluidly connects the first valve member inlet aperture to the bath outlet port and the fluid flow blocking portion blocks fluid flow between the shower head port and the first valve member inlet port, and a fully open shower head flow position that the second valve member fluid passage portion fluidly connects the inlet aperture to the shower head port and the fluid flow blocking portion blocks fluid flow between the bath port and the inlet aperture, the first valve member aperture, the second valve member aperture and the fluid passage portion being of relative sizes that the maximum fluid flow to the shower head port is less than the maximum flow to the bath port, and means connected to the second valve member for rotating the second valve member between its positions.

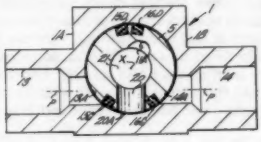
4,705,075
ROTARY THREE-WAY PLUG VALVE

Thomas E. Ray, 13191 Lakewood Dr. NE., Aurora, Oreg. 97002

Filed Jan. 17, 1986, Ser. No. 819,833

Int. Cl.[4] F16K *11/085*

U.S. Cl. 137—625.47 **6 Claims**



1. A three-way valve having a closed position and comprising in combination,

a valve housing having side wall structures defining side wall ports and an end wall defining an end wall port,

a rotatable cylindrical plug member in said housing and including multiple elongate continuous seals each extending about an uninterrupted plug outer surface area, said plug member defining a central chamber at all times in communication with said end wall defined port, a radially

directed passage in said cylindrical plug member in communication with said chamber and terminating radially outwardly in a plug member opening located intermediate said seals, said opening selectively positionable into communication with one of said side wall ports, means for imparting arcuate rotation to said plug member, said plug member closing the valve when the plug member opening is positioned intermediate the side wall ports, and

said side wall ports being in a plane offset from the rotational axis of said plug member.

4,705,076

MANIFOLD FITTING FOR A COMPRESSED AIR TANK

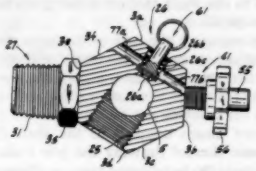
Joseph L. Krechel; Michael J. Purvis, and Paul F. Ross, II, all of St. Louis, Mo., assignors to Control Devices, Incorporated, St. Louis, Mo.

Filed Sep. 12, 1986, Ser. No. 906,389

The portion of the term of this patent subsequent to Oct. 14, 2003, has been disclaimed.

Int. Cl.[4] F16K *11/10*

U.S. Cl. 137—883 **4 Claims**



1. A manifold fitting for a compressed air tank comprising:

an elongate main body of hexagonal cross-section with first and second ends, the first end being of reduced circular cross-section;

said body having an axial passage extending from the first end toward and terminating short of the second end;

said first end being externally threaded for attachment of the fitting to a tank for communication with the tank via the passage;

said body having a first lateral opening extending inwardly to said axial passage from a first face of the six faces of the body;

an outlet member threaded in said first lateral opening in the body having a valve seat at its inner end toward said passage;

said body having a second lateral opening extending inwardly to said passage from a second of the six faces of the body opposite said first face, said second lateral opening being opposite said first lateral opening and in axial alignment therewith;

a valve member threaded in said second lateral opening extending across said passage with space around said valve member for flow of air, said valve member being adapted to be threaded inwardly in said second lateral opening to a closed position in engagement with the valve seat and to be threaded outwardly with respect to said second lateral opening to an open position for flow of air from the tank through said passage and out through said outlet member, said valve member having a stem with an axial stem passage therein extending inwardly partway from its outer end to at least one port in the valve stem for communication with the axial passage in the main body;

a filler check valve in the axial stem passage of said valve member for filling the tank with compressed air via application of a coupling at the end of a compressed air supply to said stem;

said body having a third lateral opening extending inwardly from a third of said six faces to said passage;

a pressure relief safety valve at said third lateral opening in the body; and

said body having a fourth threaded lateral opening extending inwardly from a fourth of said faces to said passage for receiving a pressure gauge.

4,705,077

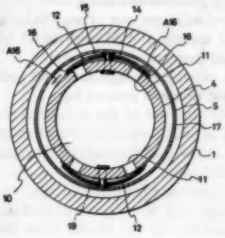
PULSATION DAMPING MEANS INCORPORATING THEREIN AN INNER CYLINDER HAVING LAMINATED RESILIENT VALVE SHOES

Nobuyuki Sugimura, 308, Mabase, Shimizu-shi, Shizuoka-ken, Japan

Continuation of Ser. No. 751,141, Jul. 2, 1985, abandoned. This application Jan. 12, 1987, Ser. No. 5,373

Int. Cl.[4] F16L *55/02*

U.S. Cl. 138—30 **7 Claims**



1. In a pulsation absorbing device including a pressure vessel, a cylindrical resilient diaphragm, an inner cylinder disposed within the diaphragm substantially concentric therewith, and the inner cylinder having radially directed hydraulic fluid openings therethrough, the improvement comprising: resilient valve shoes of arched shape in transverse cross section disposed upon the outer surface of said inner cylinder and at a location to cover said fluid openings and to uncover said fluid openings for flow past the shoes; each of said valve shoes being a laminated valve composed of a plurality of thin resilient membranes one over the other in slidable contact with each other and each arched relative to the inner cylinder to uncover the hydraulic fluid openings and being capable of conforming to the outer surface of the inner cylinder to cover such openings when urged against the cylinder by the expanding diaphragm, said membranes acting together to provide combined thickness and strength to cover and uncover said openings while sliding relative to each other responsive to hydraulic fluid pulsations.

4,705,078

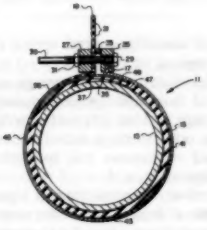
PIPE REPAIR CLAMP

Ronald S. Montgomery, 1308 Cherry St., Gainesville, Tex. 76240

Filed Sep. 20, 1985, Ser. No. 778,363

Int. Cl.[4] F16L *55/16*

U.S. Cl. 138—99 **11 Claims**



1. A clamp for repairing a pipe, which comprises:

a flexible metal band having first and second ends with a length therebetween sufficient to encircle the pipe, said metal band including an inside surface adapted to face said pipe and an oppositely facing outside surface, said band including a plurality of holes spaced apart lengthwise on said band adjacent said second end;

an elastomeric gasket sheet having an outside surface facing said metal band and an oppositely facing inside surface, with a portion of said outside surface of said gasket sheet being attached to the inside surface of said metal band and said gasket sheet having two free ends with a length therebetween sufficient to encircle said pipe with one of said free ends overlapping the other of said free ends;

a first lug connected to said first end of said metal band;

a second lug positionable along said outside surface of said metal band adjacent one of said holes in said metal band with said second end of said metal band extending between said first and second lugs;

bolt means passing through said one hole for drawing together said first and second lugs;

a metal strip attached to the outside surface of one of said free ends of said gasket sheet, said metal strip underlying said first and second lugs when said metal band is wrapped around said pipe;

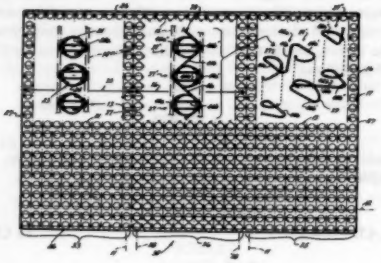
and a tab connected to one of said lugs and disposed between said lug and said second end of said metal band for contacting said second end of said metal band when said first and second lugs are drawn together, said tab being also disposed radially outward of said bolt means to rotate said lugs inwardly toward each other when said lugs are drawn together.

4,705,079

BEDDING COIL SPRING UNIT AND ASSEMBLY METHOD

Larry Higgins, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Division of Ser. No. 721,575, Apr. 10, 1985, Pat. No. 4,625,349.
This application Jun. 6, 1986, Ser. No. 871,533
Int. Cl.[4] B21F *27/16*
U.S. Cl. 140—3 CA **6 Claims**



1. A method of assembling a coil spring unit, said method comprising the steps of

forming a series of rows of coil springs, each of said rows being formed from a single continuous length of wire, adjacent springs withins aid row being directly connected one with the other through use of connector sections,

connecting said continuous coil spring rows together in matrix configuration, and

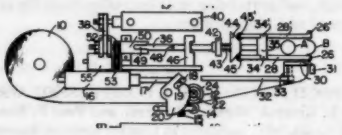
thereafter selectively disconnecting at least some of the coil springs within at least some of the rows from those coil springs adjacent thereto in order to provide a finished coil spring unit having at least a portion of the coil springs separate and apart from one another in at least a portion of said unit's rows.

4,705,080

BUNDLE TYING MACHINE

John F. Hanscom, Rehoboth, Mass., assignor to H.F. Hanscom & Company, Inc., Providence, R.I.

Filed Aug. 25, 1986, Ser. No. 899,554
Int. Cl.[4] B21F *7/00*
U.S. Cl. 140—93 A **2 Claims**



1. A bundle tying device for wrapping a tie about a bundle and twisting the tie comprising:

(a) a pair of longitudinally movable arms having gripping jaws at one end thereof,

(b) a shaft, the arms being pivoted intermediate the ends thereof to the shaft, said arms being normally oriented in a datum position,

(c) means engaging the end of the arms remote from the gripping jaws to impart movement of the jaw ends toward each other, seperate means urging the jaw ends apart,

(d) means feeding tie stock across the arms into the jaws,

(e) means for severing the tie stock,

(f) retractor means coupled to the shaft for longitudinal movement thereof drawing the jaw ends with tie stock therein over the bundle into tying position whereby the tie stock partially embraces the bundle,

(g) means imparting closing movement of the jaw ends,

(h) a sleeve having a slot embracing the shaft,

(g) means imparting closing movement of the jaw ends,

(h) a sleeve having a slot embracing the shaft,

(i) means including a rotary actuator coupled to said sleeve, a drive pin on said shaft, said pin engaging said slot in said sleeve whereby rotational movement to the arms is imparted only while in closed position to twist the tie in one direction and tighten it about the bundle,

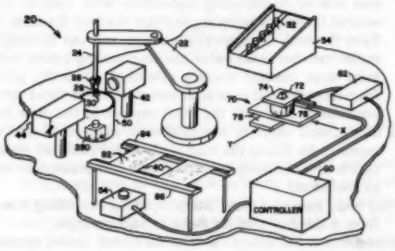
(j) said retractor means moving the arms from tying position to datum position and disengaging the drive pin and sleeve slot engagement.

4,705,081

SYSTEM FOR SENSING AND FORMING OBJECTS SUCH AS LEADS OF ELECTRONIC COMPONENTS

John Birk, Los Altos; Heinz Breu, Mountain View; William Gong, Sunnyvale; Charles C. Morehouse, Cupertino, and Sidney Liebes, Jr., Atherton, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 21, 1986, Ser. No. 832,481
Int. Cl.[4] H05K *3/30*
U.S. Cl. 140—147 **24 Claims**



1. An apparatus for determining whether any leads of a first

component having two or more leads with a lead configuration needs to be bent in order for all the leads to fit into predetermined holes in a second component, wherein the leads of the first component have approximately the same length, said apparatus comprising:

means for sensing the positions of the tips of the leads of the first component; and

means for comparing the positions of the leads to the positions of the predetermined holes before the leads are inserted into the holes and for determining from the comparison which leads, if any, need to be bent so that, for a variety of lead configurations, after such leads have been bent, all the leads of the first component will fit simultaneously into the holes without requiring any further bending.

4,705,082

METHOD OF AND APPARATUS FOR FILLING A CONTAINER WITH GAS

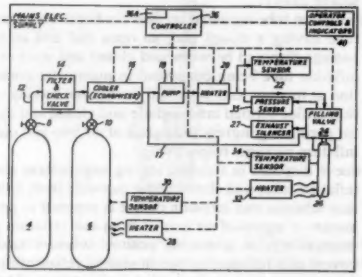
Hew D. Fanshawe, The Elms, Broad Street, Bampton, Oxfordshire OX8 2LS, and John K. Conway, 22 Queensway, Sawston, Cambridge CB2 4DJ, both of England

Filed Jun. 26, 1985, Ser. No. 756,500

Claims priority, application United Kingdom, Nov. 16, 1983, 8330532; Nov. 29, 1983, 8331869; Jul. 18, 1984, 8418255; PCT Int'l Appl., Nov. 12, 1984, PCT/GB84/00390

Int. Cl.[4] B65B *31/00*

U.S. Cl. 141—4 **2 Claims**



1. A method of filling a container of unmeasured volume with carbon dioxide to a preselected density above the criical density comprising the steps of:

(a) establishing, for the particular preselected density, that set of pressures each of which characteristically corresponds to a unique temperature higher than the saturation temperature of carbon dioxide for that desnity;

(b) registering this 1-to-1 relationship between the pressure and temperature in a suitable form to be available for reference, or for comparison with indicated pressures or indicated temperatures;

(c) supplying the carbon dioxide to the container;

(d) controllably heating the container or the carbon dioxide being supplied to the container or both to a temperature such that the contents of the container, when the preselected density has been reached, are in single phase;

(e) monitoring the temperature of the container, inferring the temperature of the carbon dioxide in the container, and identifying the registered pressure level corresponding to this temperature and to the selected density;

(f) monitoring the pressure in the container and comparing it with the registered pressure level, or successive levels, identified;

(g) discontinuing the supply of carbon dioxide as the pressure in the container attains the registered pressure level corresponding to the instantaneous temperature of the carbon dioxide in the container.

4,705,083

METHOD AND MACHINE FOR BATCHING COLORING AGENTS INTO PAINTS AND VARNISHES

Edoardo Rossetti, Finale Emilia, Italy, assignor to Corob S.R.L. Automatic Machinery Project, Modena, Italy

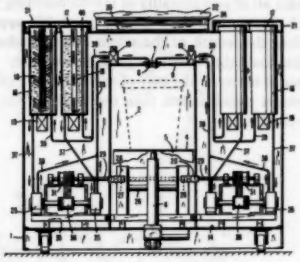
PCT No. PCT/EP85/00528, § 371 Date Jun. 11, 1986, § 102(e) Date Jun. 11, 1986, PCT Pub. No. WO86/02320, PCT Pub. Date Apr. 24, 1986

PCT Filed Oct. 9, 1985, Ser. No. 878,955

Claims priority, application Italy, Oct. 12, 1984, 40094 A/84

Int. Cl.[4] B65B *1/30*

U.S. Cl. 141—104 **6 Claims**



1. A machine for batching coloring agents into a paint or varnish medium by volume comprising:

a housing; a plurality of reservoirs mounted within said housing and adapted each to contain a liquid coloring agent, and stirring means disposed within each reservoir for stirring the coloring agent therein;

n nozzles for dispensing coloring agents into said medium;

n pumps and n solenoid valves;

conduit means for connecting each reservoir with a nozzle through a pump and solenoid valve whereby the pump will pump coloring agent from the reservoir through the valve and through the nozzle when the valve is open and for returning coloring agent to the reservoir when the valve is closed;

an electric stepping motor means operably coupled to each pump for driving said pumps; and

microprocessor control means coupled to said motor and to each of said valves for opening and closing only predetermined valves in a predetermined sequence and for stepping said motor means in a predetermined number of steps during said sequence;

whereby when the microprocessor control means calibrates said machine to compare the pump flow rate for each pump, and corrects said flow rate comparison for the viscosity of each coloring agent and the time delay for opening and closing each solenoid valve, the quantity of agent dispensed through each nozzle first step of said motor is calculated so that only predetermined quantities of predetermined sequence as said microprocessor control means steps said motor and opens and closes aid valves.

4,705,084

COVER FOR OUTDOOR TABLE AND BENCHES

Jimmy L. Rodebaugh, and Onetta R. Rodebaugh, both of R.R. #1, Box 660, Ochelata, Okla. 74051

Filed May 28, 1985, Ser. No. 738,412

Int. Cl.[4] A47B *13/00*

U.S. Cl. 150—52 R **19 Claims**

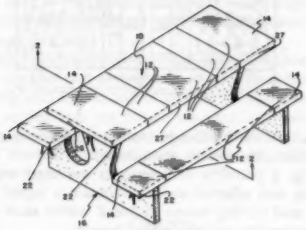
1. A removable cover for a rectangular surface having four corners comprising

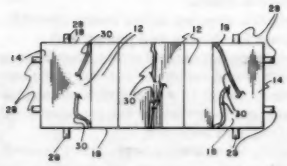
a plurality of interconnecting panels having a pair of opposed outermost panels and adapted to overlie the top of the rectangular surface;

each of said pair of outermost panels having a pair of opposed panel sides and a pair of corners including a seam at

each corner such that when the cover removably lodges over the top of the rectangular surface, each of the seams essentially snugly engages the general vertical section of one of the corners of the rectangular surface and a breadth depending skirt is integrally formed having a width approximately equaling the length of the seams and extending over the breadth edge of the rectangular surface; each of the plurality of interconnecting panels has a pair of opposed panel sides, and when each of the seams essentially snugly engages the general vertical section of one of the corners of the rectangular surface a length depending skirt is integrally formed along the pair of opposed panel sides for all of said plurality of interconnecting panels, said length depending skirt having a width approximately equaling the length of the seams and extending over the longitudinal edge of the rectangular surface;

the distance between the pair of seams for any of the pair of outermost panels is less than the width of the respective outermost panel;





any two contiguous interconnecting panels comprises at their respective interconnecting points a pair of interconnected panel loops defined from looping two respective contiguous panel edges of the two contiguous panels and securing the looped panel edges to the structure of the respective contiguous panels and subsequently interconnecting the respective panel loops of the two contiguous panels;

a first pair of loops secured to each of the pair of outermost panels between the respective pair of seams;

a second pair of loops opposedly secured to the pair of opposed panel sides of each of the pair of outermost panels;

and a pair of outer straps opposedly secured to the pair of opposed panel sides of each of the pair of outermost panels and each respective pair of outer straps is adapted to slidably, removably pass through one of the first pair of loops and one of the second pair of loops and bind together to releasably secure the cover to the top of the rectangular surface.

4,705,085

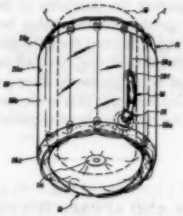
INFLATABLE BEVERAGE INSULATOR

Dwight C. Brown, 504 Live Oak, Pasadena, Tex. 77506

Filed Dec. 9, 1985, Ser. No. 806,537

Int. Cl.[4] B65D *23/08, 25/34, 65/02*

U.S. Cl. 220—400 **2 Claims**



1. An inflatable beverage insulator for receiving a beverage container for keeping the beverage container in a thermally protected environment, comprising, in combination:

a container receptacle for receiving the beverage container, said container receptacle including a jacket portion;

said jacket portion formed in a generally cylindrical configuration for receiving the beverage container therein;

said container receptacle having an interior surface and an exterior surface, said interior surface and said exterior surface being joined together to form a pneumatically secure cavity;

an inflation tube mounted on said container receptacle, said tube having a closed end, an open end and an inflation passage disposed between said closed and open ends, said inflation tube being connected in pneumatic communication at its open end with said cavity and having an inflation orifice formed intermediate said closed and open ends for permitting ingress and egress of air into and out of said inflation passage, respectively;

a sleeve disposed in slidable, sealing engagement about said inflation tube, said sleeve being movable from a first position wherein said inflation orifice is exposed to permit the ingress or egress of air into or from said inflation passage, respectively, to a second positon wherein said sleeve covers said inflation orifice in sealing relationship to prevent the ingress or egress of air into or from aid inflation passage, respectively; and

an outer sheath adapted to be disposed about said container receptacle for protecting said exterior surface of said container receptacle.

4,705,086

WALLET FOR JOGGERS

James J. O'Neill, 37 South Washington Ave., Hartsdale, N.Y. 10530

Continuation-in-part of Ser. No. 796,801, Nov. 12, 1985, abandoned. This application Dec. 22, 1986, Ser. No. 942,059

Int. Cl.[4] A45C *1/06, 11/32, 13/18*

U.S. Cl. 150—134 **18 Claims**

1. A wallet for use while jogging or the like, comprising:

a back panel of flexible material which is foldable between an open and a closed position about a fold axis so that generally symmetrical inside surface portions of said back panel on opposite sides of said fold axis move toward one another when said back panel is folded toward said closed position, and a linear folded edge substantially coincident with said fold axis is formed by an outside surface of said back panel when at said closed position;

said folded edge measuring at most about 4.0 inches (10.16 cm.);

a first flexible pocket panel secured along peripheral edges thereof to one of said inside surface portions of said back panel to define a first pocket;

a second flexible pocket panel secured along peripheral edges thereof to the opposite one of said inside surface portions of said back panel to define a second pocket;

an elongate generally U-shaped hook member with legs of resilient material of a certain width and having a hook inside surface and a hook outside surface, said hook member projecting outside said back panel with the width center line of the hook member perpendicular to the center of said folded edge, said hook member having a closed end in the vicinity of said folded edge of said back panel when in said closed position, the overall dimensions of said hook member and said back panel being such that the wallet can be worn securely and concealed between a waistband and a wearer's body when said back panel is in said closed position and the waistband is clamped by an outside leg of said hook member up to said closed end;

wherein said back panel is comprised of a first layer of flexible material defining said outside surface and a second layer of flexible material defining said inside surface portions, and a rigid hook support layer between the two flexible material layers on one side of said fold axis; and

an inside leg of said hook member extends between said hook support layer and the first layer of flexible material forming said back panel, the hook outside surface on said inside leg being fixed against said hook support layer, and an upper part of said inside leg adjacent the closed end of said hook member projecting out of an opening in the first layer of flexible material.

8. A wallet for use while jogging or the like, comprising:

a back panel of flexible material which is foldable between an open and a closed position about a fold axis so that generally symmetrical inside surface portions of said back panel on opposite sides of said fold axis move toward one another when said back panel is folded toward said closed position, and a linear folded edge substantially coincident with said fold axis is formed by an outside surface of said back panel when at said closed position;

said folded edge measuring at most about 4.0 inches (10.16 cm.);

a first flexible pocket panel secured along peripheral edges thereof to one of said inside surface portions of said back panel to define a first pocket;

a second flexible pocket panel secured along peripheral edges thereof to the opposite one of said inside surface portions of said back panel to define a second pocket; and

a detachable, elongate generally U-shaped hook member with legs of resilient material of a certain width and having a hook inside surface and a hook outside surface, said hook member being arranged to project outside said back panel with the width center line of the hook member perpendicular to the center of said folded edge, said hook member having a closed end in the vicinity of said folded edge of said back panel when in said closed position, the overall dimensions of said hook member and said back panel being such that the wallet can be worn securely and concealed between a waistband and a wearer's body when said back panel is in said closed position and the waistband is clamped by an outside leg of said hook member up to said closed end;

said back panel being constructed and arranged to engage said hook member firmly at an area of attachment formed in the outside surface of said back panel, wherein said area of attachment is beneath or flush with the surrounding portion of said back panel when said hook member is detached.

4,705,087

CONVOLUTED CONE WHEEL

Edward G. Markow, Oakdale, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jun. 17, 1985, Ser. No. 745,533
Int. Cl.[4] B60B *9/00, 1/06*
U.S. Cl. 152—5 **26 Claims**

1. A non-pneumatic convoluted cone wheel comprising:

a hub section for receiving an axle;

a resilient annular toroidal wheel body section extending radially outwardly from said hub section and having a ground-engaging rim at its peripheral edge portion distal from said hub section;

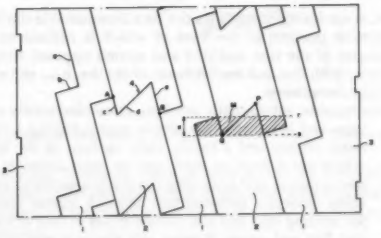
and means automatically operative in all condiitons of operation for changing the spring rate upon a certain amount of deformation of said toroidal section.

4,705,088

TREAD-PATTERNS OF MOTOR-VEHICLE TIRES

Giuliano Ghilardi, Milan, Italy, assignor to Pirelli Coordinamento Pneumatici S.p.A., Italy

Filed May 22, 1985, Ser. No. 736,821
Claims priority, application Italy, Jun. 1, 1984, 21206 A/84
Int. Cl.[4] B60C *11/12*
U.S. Cl. 152—209 R **8 Claims**



1. In a tire for vehicle wheels, comprising first and second sidewalls, a crown zone having a tread band that axially extends from said first sidewall to said second sidwall of said tire, said tread band having impressed thereon a pattern that com-

prises a plurality of circumferential grooves bounded by a pair of circumferential zig-zag lines having a depth delimiting at least two outer and one inner ribs, said circumferential zig-zag lines that delimit each rib comprising a periodic succession of long and short sides inclined with respect to the circumferential direction of said tire and disposed substantially perpendicular to each other, the two axially outer ribs being circumferentially continuous, and at least one axially inner rib being subdivided into a series of circumferential blocks separated by a continuous transverse lamel that extends from one to the other side of said rib, between two vertices created by the meeting of two contiguous sides on each flank, and opens out into said grooves that delimit said rib, the improvement wherein

said circumferential zig-zag line that delimits each rib comprises a periodic succession of one long side inclined with respect to the circumferential direction of said tire according to an angle having a value of not exceeding 30° and three short sides, each having a length not greater than 35% of said long side,

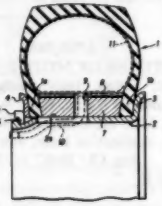
said lamel having a broken lay-out that extends between vertices created on each flank of the rib by the meeting of two short contiguous sides, and having a broken-line lay-out that comprises three successive straight segments, two lateral segments each constituting the extension of the short side, as disposed perpendicularly on the long side, and a central segment extending between two points at least one of which lies outside of a circumferential interval delimited by a pair of axial straight lines each passing through a point where said lamel opens into said grooves, the lamel having a depth equal to at least 60% of the depth of said circumferential grooves.

4,705,089

WHEEL WITH LOCKING SLEEVE

Alexandre Forneris, Paris, France, assignor to Hutchinson S.A., Paris, France

Continuation of Ser. No. 457,225, Jan. 11, 1983, Pat. No. 4,558,728. This application Aug. 28, 1985, Ser. No. 770,241
Claims priority, application France, Jan. 15, 1982, 82 00607
The portion of the term of this patent subsequent to Dec. 17, 2002, has been disclaimed.
Int. Cl.[4] B60C *15/02*
U.S. Cl. 152—400 **16 Claims**



1. A device for mounting a tire on a dismountable rim having a bottom portion, at the level of which is defined an outer diameter of the rim, and first and second opposed flanges in contact with first and second beads of the tire, respectively, the device comprising:

deformable, substantially voidless, circumferentially continuous and incompressible sleeve means having a radially outer surface and a radilly inner surface, at the level of which are defined an outer and an inner diameter of the sleeve means, and encircling the rim in a mounted state for being deformed between said first and second beads and for holding said first and second beads of said tire against said first and second flanges, said sleeve means having an opening formed therein for permitting passage of air therethrough, and

circumferentially continuous reinforcement means positioned in said sleeve means for causing locking engagement of said sleeve means on said bottom portion of said rim, thus securing said first and second beads of said tire between said sleeve means and said first and second flanges, respectively, wherein:

(i) said reinforcement means is substantially axially continuous between lateral sides of said sleeve means and arranged at an upper portion of said sleeve means in the vicinity of said radially outer surface of said sleeve means, the radial thickness of said sleeve means being substantially constant and the same as said first and second flanges, such that the outer diameter of said sleeve means is substantially constant over the whole of said outer surface, and wherein

(ii) said inner diameter of said sleeve means is, in a free state, over the whole of said radially inner surface, substantially equal to the outer diameter of said rim,

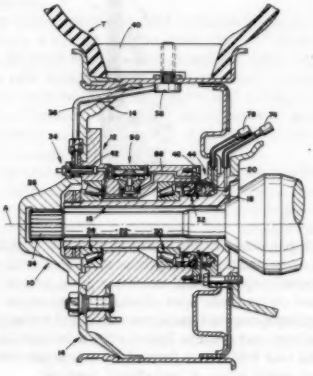
such that said sleeve means is mountable on the rim, in a free state, and is in locking engagement on the bottom portion of the rim, when in a mounted state.

4,705,090

APPARATUS FOR CONTROLLING AIR PRESSURE IN VEHICLE TIRES

Josef A. Bartos, Diamond Bar, Calif., assignor to Tire Inflation Systems Corp., Eastlake, Ohio

Filed Jan. 17, 1986, Ser. No. 819,716
Int. Cl.[4] B60C *29/00, 23/16*
U.S. Cl. 152—417 **29 Claims**



1. Apparatus for controlling the air pressure in a tire on a vehicle having rotatable wheel means carrying said tire and fixed support means rotatably supporting said wheel means comprising, said support means having fixed surface means and said wheel means having rotatable surface means spaced from the opposing said fixed surface means, means providing said wheel means with first air flow passageway means opening through said rotatable surface means into the space between said fixed and rotatable surface means, means providing said support means with second air flow passageway means opening through said fixed surface means into said space, sealing means provided on said fixed support means and displaceable across said space between first and second positions in which said sealing means is respectively spaced from and in engagement with the rotatable surface means of said wheel means, said sealing means in said second position sealingly interengaging said fixed and rotatable surface means and placing said first and second air flow passageway means in sealed flow communication with each other across said space, means to displace said sealing means between said first and second positions, said first passageway means having an end in air flow communica-

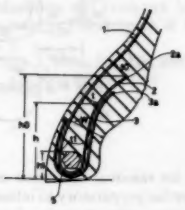
tion with said tire, and valve means closing said first passageway means to air flow therethrough when said seal means is in said first position.

4,705,091

HEAVY DUTY PNEUMATIC RADIAL TIRES

Munenori Iuchi, Shirakawa, Japan, assignor to Sumitomo Rubber Industries, Ltd., Japan

Filed Jul. 24, 1985, Ser. No. 758,374
Int. Cl.[4] B60C *15/06*
U.S. Cl. 152—541 **10 Claims**



1. A heavy duty pneumatic radial ply tire, comprising:
a carcass having a pair of axially spaced circumferentially extending bead cores and covered by rubber to define a tire bead seat adjacent each bead core;
a carcass ply having a plurality of steel cords extending from bead to bead, with the ends of the cords being turned up around the bead core from the axial inner to the axial outer side thereof, the outermost ends of the turned up portion being at a perpendicular height h0 above its bead seat of 55 to 80 mm, the steel cords of the carcass ply lying at an angle of 90° to 70° with respect to the equatorial plane of the tire;
a belt having a plurality of cords lying at an angle of 10° to 30° with respect to the equatorial plane of the tire and circumferentially extending on the carcass ply;
a reinforcing layer in each bead region comprising cords disposed adjacent to the outside of the turned up portion of the carcass ply;
the ratio t/h of the rubber thickness t at the height h between the carcass ply and its turned up portion to the height h, decreasing gradually in inverse proportion to the values of h/h0 within the range of $0.3 \leqq h/h0 \leqq 0.5$; the rate of the decrease in the ratio t/h, decreasing gradually in inverse proportion to the values of h/h0 within the range of $0.5 \leqq h/h0 \leqq 0.8$; and the ratio t/h taking an approximate constant value from 0.1 to 0.25 within the range of $0.8 < h/h0 \leqq 1.0$; wherein the rubber thickness t at a height h between the carcass ply and its turned up portion is defined as the minimum distance from the point on the turned up portion of the carcass ply at a perpendicular height h above the tire bead seat to the carcass ply.

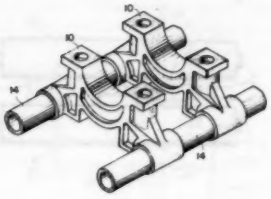
4,705,092

MANUFACTURING METHOD FOR AN INTEGRAL TYPE CRANKSHAFT BEARING CAP

Toshio Ito, Susono; Shunichi Fujio, Aichi, and Takeyoshi Taya, Toyoake, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 18, 1986, Ser. No. 853,718
Claims priority, application Japan, Apr. 19, 1985, 60-82226
Int. Cl.[4] B22D *19/04*
U.S. Cl. 164—34 **14 Claims**

1. A method of manufacturing an integral type crankshfat bearing cap for an internal combustion engine, said integral type crankshaft bearing cap including a beam and a plurality of crankshaft bearing caps disposed at longitudinally spaced locations along at least a portion of the length of said beam, said beam being adapted to extend in a longitudinal direction of said engine, each said crankshaft bearing cap having a forward face adapted to face toward the front of said engine and a rearward face adapted to face toward the rear of said engine, said method comprising the steps of:
(a) making resin models of said crankshaft bearing caps, each said model having a forward face and a rearward face, each having recessed portions surrounded by rib portions, and a bore for receiving said beam;



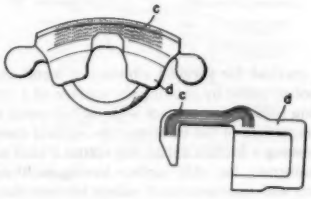
(b) passing said beam through said bore of each of said models; and
(c) replacing, by full mold casting, said resin of said models with metal, thereby integrating said metal crankshaft bearing caps and said beam to form said integral type crankshaft bearing cap.

4,705,093

METHOD OF CASTING THE FIBER-REINFORCED CALIPER

Kinji Ogino, Kuki, Japan, assignor to Akebono Brake Industry Co., Ltd. and Akebono Research and Development Centre Ltd., both of Tokyo, Japan

Filed Jun. 18, 1986, Ser. No. 875,727
Claims priority, application Japan, Jun. 20, 1985, 60-135026
Int. Cl.[4] B22D *19/14*
U.S. Cl. 164—97 **2 Claims**

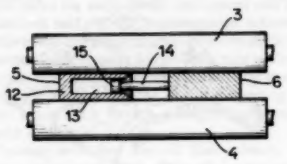


1. A method for casting a fiber-reinforced caliper comprising:
(a) winding inorganic fibers around a core in a direction parallel to the cylindrical axis of said core which conforms approximately to the inside shape of the bridge portion of a caliper,
(b) cutting off the fibers so wound up into the approximate shape of the bridge, and
(c) casting under high pressure matrix metal onto the so cut-off fibers to form it into the shape of a caliper.

4,705,094
DISTANCING MEANS FOR DUMMY BARS IN CONTINUOUS CASTING APPARATUS

Horst Grothe, Kaarst, and Gerhard Arnolds, Mulheim-Ruhr, both of Fed. Rep. of Germany, assignors to SMS Concast Inc., Montvale, N.J.

Filed Jul. 18, 1986, Ser. No. 888,142
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1985, 3525969
Int. Cl.[4] B22D *11/08*
U.S. Cl. 164—426 19 Claims

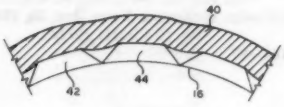


1. A continuous casting apparatus, comprising a pair of dummy bars each of which is movable to a respective predetermined position preparatory to initiating strand withdrawal, said dummy bars being disposed side-by-side and defining a gap when said dummy bars are in said positions simultaneously; and means for distancing said dummy bars from one another, said distancing means including a rod-like member receivable by one of said dummy bars in such a manner as to extend transversely of said one dummy bar across at least a portion of said gap, and said distancing means comprising a piston-and-cylinder unit in said one dummy bar, said piston-and-cylinder unit including a piston rod which at least in part constitutes said rod-like member.

4,705,095
TEXTURED SUBSTRATE AND METHOD FOR THE DIRECT, CONTINUOUS CASTING OF METAL SHEET EXHIBITING IMPROVED UNIFORMITY

Thomas A. Gaspar, Columbus, Ohio, assignor to Ribbon Technology Corporation, Gahanna, Ohio

Filed Jan. 9, 1986, Ser. No. 817,514
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—463 6 Claims



1. A method for forming ribbon-like metal sheet directly from molten metal by rotating the surface of a rotating, heat extracting substrate in contact with molten metal to solidify it upon the surface of the substrate, the method comprising:

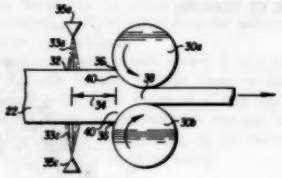
(a) forming a friction enhancing textured chill surface upon a substrate, the chill surface having multi-sided protrusions with interconnected valleys between the protrusions to provide a plurality of discontinuous surfaces which face obliquely toward the direction of travel of the substrate surface; and

(b) rotating the substrate upwardly across an edge of the upper surface of the molten metal at a surface velocity sufficiently fast to prevent complete chill surface replication and thereby causing the melt surface which interfaces the chill surface to bridge between the protrusions and leave a space into which boundary gas can escape and a depth below the surface of the molten metal greater than the height of the protrusions.

4,705,096
EXFOLIATION OF SURFACE OXIDE FROM CONTINUOUSLY CAST COPPER BAR IN CONJUNCTION WITH INLINE HOT ROLLING

E. Henry Chia, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Sep. 8, 1981, Ser. No. 300,144
Int. Cl.[4] B22D *11/00*
U.S. Cl. 164—476 8 Claims



1. A method for removal of surface oxide from a continuously cast copper bar preparatory to inline hot rolling, wherein solidified bar continuously advancing from a continuous caster is directed to a continuous hot rolling mill, comprising:

passing said advancing bar, being at hot rolling temperature, through a spray zone of selected quench capacity and impulse, such that for each segment of said bar passing through said spray zone, said oxide is quenched to a black heat but is not ablated and said underlying bar is subjected to a shallow quench;

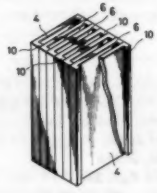
said spray zone being situated in close proximity to but selectively spaced upcourse from the first rolls of said hot rolling mill such that there is insufficient time for substantial reheating of said quenched oxide during the approach to said first rolls;

whereupon as quenched segments of the advancing bar progressively approach said first rolls and said underlying bar begins to deform just prior to roll contact, said oxide spalls off the bar surfaces substantially; thereby descaling said bar while minimally effecting its hot forming characteristics and preventing reoxidation prior to rolling.

4,705,097
RADIATOR DEVICE

Hideo Mita, Okazaki, and Shuichi Kurazono, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 25, 1986, Ser. No. 843,587
Claims priority, application Japan, Mar. 30, 1985, 60-67662; Mar. 30, 1985, 60-67663
Int. Cl.[4] F28D *17/02*
U.S. Cl. 165—4 1 Claim



1. A radiator device comprising:

a plurality of filler plates, each of said plates being made from a material having a low heat conductivity and high specific heat;

a plurality of spacer means positioned on each side of said filler plates in the form of projections projecting from said each side to form a fluid passage therebetween;

a housing having an inlet and an outlet substantially centrally positioned with respect to the housing for a fluid and enclosing a filler assembly formed by said filler plates and spacer means; and

at least three of said filler assemblies positioned in said housing so that each said assembly is positioned at an angle to an adjacent filler assembly so as to reduce heat conductivity in a fluid flow direction.

4,705,098

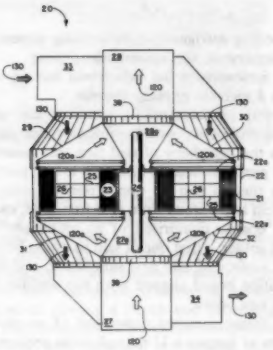
LABYRINTH ARTICULATION JOINT FOR REGENERATIVE AIR HEATER SEAL FRAME

David W. Gerber, Massillon, and Frederick M. Untch, Canton, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed May 2, 1986, Ser. No. 859,278

Int. Cl.[4] F28D *17/04*

U.S. Cl. 165—4 **10 Claims**



8. An articulation joint mountable in the radial arms of a seal frame of a rotary regenerative air heater used to transfer heat from the gas side to the air side of the heater to permit the seal frame to conform to the surface of the stator of the air heater, comprising:

a first hinge;

a second hinge;

means for removably coupling the first hinge to the second hinge; and

means, located internally on the first and second hinges, for presenting a succession of right angle turns to air attempting to leak through the joint across the height, width and depth thereof to minimize leakage of air from the air side to the gas side of the air heater through the articulation joint and erosion of the joint from abrasive particles entrained in the air.

4,705,099

QUICK FREEZE COOLING/HEATING UNIT POWERED BY AUTOMOTIVE AIR CONDITIONER

Fumio Taniguchi, Ebina, and Tomio Matsuno, Isehara, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 24, 1985, Ser. No. 726,774

Claims priority, application Japan, Apr. 25, 1984, 59-61892[U]

Int. Cl.[4] F28F *27/00;* **G05D** *23/32;* **F25D** *17/06, 29/00*

U.S. Cl. 165—12 **3 Claims**

1. A cooling/heating unit powered by an automotive air conditioning system, said unit comprising:

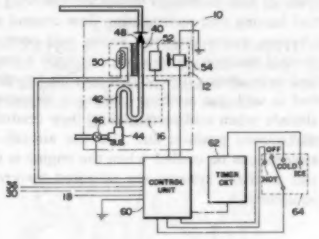
a container having first and second compartments for containing therein goods which are to be cooled or heated;

an evaporator arranged in said container and operatively connected to said air conditioning system so as to allow the coolant of said system to flow in said evaporator;

an electric fan for producing air flow in said first compartment when electrically energized;

a temperature sensor for sensing a temperature in said first compartment;

first means for energizing said electric fan when the temperature sensor senses that the temperature in said first compartment is higher than a predetermined degree;



second means for suspending energization of said electric fan for a predetermined time, even when said temperature sensor senses the higher temperature in said first compartment, to thereby initiate quick freezing of goods in said second compartment;

third means for selectively operating said first and second means; and

an electric heater arranged in said container for heating the interior of said first compartment when said first and second means are both in their inoperative conditions.

4,705,100

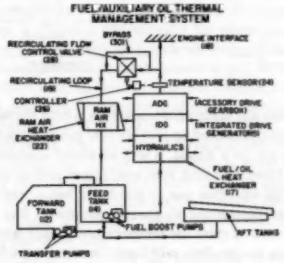
FUEL/AUXILIARY OIL THERMAL MANAGEMENT SYSTEM

Stephen J. Black, Huntington Station; Richard Hitzigrath, Sayville; Arnold Rosenblatt, Massapequa Park, and Douglas H. Grundy, E. Islip, all of N.Y., assignors to Grumman Aerospace Corp., Bethpage, N.Y.

Filed Jul. 11, 1986, Ser. No. 884,399

Int. Cl.[4] F02C *7/224*

U.S. Cl. 165—40 **7 Claims**



1. An arrangement that uses aircraft fuel as a heat sink for aircraft auxiliary oil systems for an aircraft having at least one engine operated by fuel and having an engine interface limit, comprising:

(a) fuel/oil heat exchanger means for removing heat from the aircraft auxiliary oil systems and having a fuel outlet temperature;

(b) temperature sensing means for determining temperature of the fuel leaving said heat exchanger means;

(c) recirculating flow control means having variable positions including an open and a closed position controlled

by said temperature sensoring means, the fuel always going to the aircraft engine but also going through said recirculating flow control means when said recirculating flow control means is in said open position so that recirculation is minimized and maximum heat is rejected to the engine by said fuel outlet temperature of said fuel/oil heat exchanger means when said fuel outlet temperature of said fuel/oil heat exchanger means is controlled to the engine interface limit:

(d) ram air heat exchanger means for removing heat from the fuel leaving said recirculating flow control means; and

(e) bypass means disposed across said recirculating flow control means so as to always provide a small amount of fuel recirculation flow so that possible freezing of stagnant fuel in said ram air heat exchanger is prevented at high altitude when said recirculating flow control means is in said closed position and also the aircraft auxiliary oil systems can be cooled when the engine is not operating and auxiliary systems are powered by ground support equipment.

4,705,101

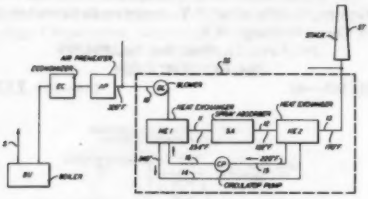
FLUE GAS REHEAT APPARATUS

Donald F. Warner, Latham, N.Y., assignor to Heat Exchanger Industries, Inc., Latham, N.Y.

Continuation-in-part of Ser. No. 671,494, Nov. 14, 1984, Pat. No. 4,577,380, which is a division of Ser. No. 406,774, Aug. 10, 1982, Pat. No. 4,487,139, which is a continuation-in-part of Ser. No. 252,297, Apr. 9, 1981, abandoned, and a continuation-in-part of Ser. No. 81,789, Oct. 4, 1979, abandoned. This application Mar. 21, 1986, Ser. No. 842,276

Int. Cl.[4] F28D *15/00*; F28F *19/04*

U.S. Cl. 165—104.31 **5 Claims**



1. In flue gas treatment apparatus which includes a first heat exchanger connected to receive flue gas and transfer heat from said flue gas to a liquid, a wet scrubber connected to receive flue gas from said first heat exchanger and to mix a scrubbing liquid with said flue gas to scrub the same, and a second heat exchanger connected to receive scrubbed flue gas from said scrubber and to raise the temperature of said scrubbed flue gas, and means to circulate said liquid between said first and second heat exchangers, wherein said first heat exchanger comprises housing means defining a gas passage, and a plurality of tubes extending through said gas passage, said tubes being covered with corrosion protection coverings and said liquid being connected to pass through said tubes, the heat transfer surface areas of said heat exchangers, the circulation of said liquid between said heat exchangers, and the temperatures of flue gas entering said first heat exchanger and exiting from said second heat exchanger being so related that the temperature of that liquid received by said first heat exchanger is below the acid dewpoint of flue gas entering said first heat exchanger, whereby acid is formed in said first heat exchanger.

4,705,102

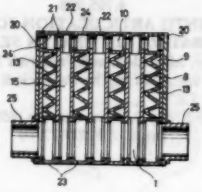
BOILING REFRIGERANT-TYPE COOLING SYSTEM

Atsushi Kanda; Kazuo Kitani, both of Hyogo, and Kiichirou Shirai, Kanagawa, all of Japan, assignors to Fuji Electric Company, Ltd., Kanagawa and Sumitomo Precision Products Co., Ltd., Hyogo, both of, Japan

Filed Dec. 13, 1985, Ser. No. 808,658

Int. Cl.[4] H01L *23/44*

U.S. Cl. 165—104.33 **3 Claims**



1. A boiling refrigerant-type cooling system for cooling an electric apparatus, said system comprising:

a first substantially flat side board having a lower portion with a sealable opening therein;

a plurality of substantially identical and substantially flat partition boards each having an outer periphery aligned with the periphery of said first side board plate, each of said partition boards having a lower portion with a first hole therein and an upper portion with a second hole therein and spaced from said first hole, each of said partition boards comprised of an aluminum core precoated with solder, a first one of said partition boards abutting the first surface of said first side board, said first hole of said partition board aligned with the sealable opening of said first side board;

a first frame member comprised of an elongated rim-like material having a U-shaped cross section and comprised of an aluminum core precoated with solder, said rim-like material of said first frame being bent in an endless annular loop substantially aligned with the periphery of said partition boards, said first frame member abutting a surface of said first partition board opposite the surface of said first partition board abutting said first side board;

a second partition board abutting a side of said first frame member opposite said first partition board;

a second member and a third frame member, said second and third frame members being comprised of said elongated rim-like material, said rim-like material of said second frame member being bent in an endless annular loop dimensioned to circumscribe the first hole of said partition boards, said rim-like material of said third frame member being dimensioned to circumscribe the second hole of said partition boards, said second frame member being aligned with said first hole of said partition boards and abutting a surface of said second partition board opposite said first frame member, said third frame member aligned with said second hole of said partition boards and abutting the surface of said second partition board opposite said first frame member;

a third partition board abutting a side of said second and third frame members opposite said second partition board;

a second substantially flat side board having a first surface and a lower portion with a sealable opening therein aligned with the first hole of said partition boards, said second side board plate facing a surface of said third partition board opposite said second and third frame members; and

said side board plates, said partition boards and said first, second and third frame members being joined by brazing to form an airtight refrigerant containing chamber aligned with said first holes of said partition boards in which the electrical apparatus is disposed and electrically connected through said openings in said first and second side boards,

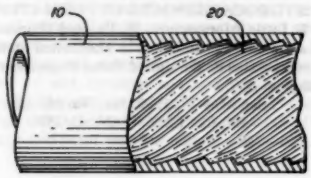
an airtight refrigerant condensing chamber in flow communication with the refrigerant containing chamber, an airtight vapor reservoir in flow communication with said airtight condensing chamber and aligned with said second holes of said partition boards, and a cooling chamber open to atmosphere and adjoining said refrigerant condensing chamber.

4,705,103

INTERNALLY ENHANCED TUBES

Robert A. Zogg; Gerald F. Robertson, both of Manlius, and Will C. Brown, Syracuse, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jul. 2, 1986, Ser. No. 881,436
Int. Cl.[4] F28B 1/00
U.S. Cl. 165—110 **2 Claims**



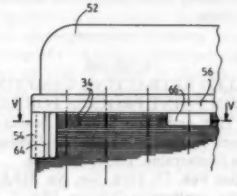
1. In a direct expansion vapor compression refrigeration system including a compressor, a condenser, an evaporator, and refrigerant, said condenser having at least one metal heat-transfer member having at least one enhanced condensing surface which is adapted to be exposed to said refrigerant in a condensing state, said enhanced condensing surface being formed with grooves having a depth not exceeding 0.0012 inches, wherein said compressor causes said condensing refrigerant to flow across said enhanced condensing surface at a mass velocity equal to or greater than 200,000 $lb/_m/hr\text{-}ft^2$.

4,705,104

HEAT EXCHANGER, IN PARTICULAR FOR A MOTOR VEHICLE, HAVING A RIGID CONNECTION BETWEEN A BUNDLE OF TUBES AND A WATER BOX AND PERFORATED PLATE ASSEMBLY

Michel Potier, Rambouillet, France, assignor to Valeo, Paris, France

Filed Feb. 21, 1985, Ser. No. 703,918
Claims priority, application France, Feb. 27, 1984, 84 02964
Int. Cl.[4] F28D 1/00
U.S. Cl. 165—149 **9 Claims**



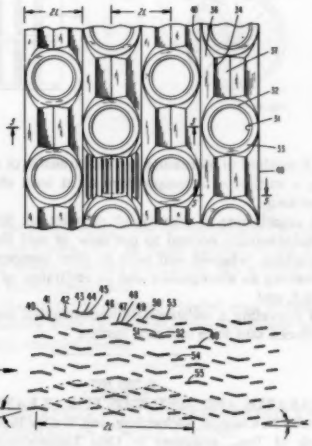
1. A heat exchanger for a motor vehicle including a tube and fin bundle and a perforated plate sealingly interengaged with each of the tubes in said bundle, and a water box mounted on said perforated plate to define an assembly therewith, said tube and fin bundle comprising a plurality of fluid conducting tubes arranged in generally aligned spaced parallel array with respect to each other and a plurality of heat exchanging fins arranged in spaced stacked array around said tubes and generally perpendicular thereto, said fins including free ends extending beyond the outermost tube on each side of said tube array, tab means carried by said water box assembly extending in generally parallel relation with said tubes along the free ends of a portion of said fin array a distance sufficient to achieve rigidity between said tube and plate assembly but significantly less than the full height of said tube and fin bundle, said tabs being configured to embrace the ends of said fins to resist torsional displacement of tube and fin bundle relative to said plate and water box assembly.

4,705,105

LOCALLY INVERTED FIN FOR AN AIR CONDITIONER

Ömer N. Cur, St. Joseph Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 6, 1986, Ser. No. 860,622
Int. Cl.[4] F28D 1/04
U.S. Cl. 165—151 **15 Claims**



1. In a finned heat exchanger unit, wherein heat transfer takes place between a first fluid flowing through a plurality of spaced-apart finned tubes and a second fluid flowing outside the finned tubes, a plurality of fins, each fin comprising:

a thin sheet of a heat conductive material formed into corrugations of predetermined pitch L and height H, comprising a plurality of crests peaked in a first direction alternating with a plurality of troughs peaked in a second direction opposite said first direction;

said thin sheet being also formed to have a plurality of substantially cylindrical collars therethrough, with the centers of said collars aligned with said troughs, each collar having a shape and size to closely fit around one of said plurality of heat exchanger tubes for conductive heat exchange therewith; and

within a local element of said fin, extending between the centers of a streamwise neighboring pair of said plurality of collars, said thin sheet being further provided with a plurality of parallel first and second cuts, between each pair comprised of a crest and an adjacent trough, whereby a strip of said thin sheet is defined between each pair of said first and second cuts between each pair comprised of a local crest and an adjacent local trough, with each one of said crests and troughs between adjacent strips being locally inverted such that a portion of each crest is locally inverted into a local trough and a portion of each trough is locally inverted into a local crest, said strips being formed into louvers each having a substantial portion

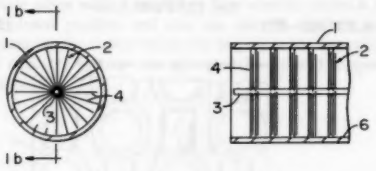
thereof formed intermediate to and aligned parallel with the closest portions of said adjacent inverted local crest and local trough, respectively.

4,705,106

WIRE BRUSH HEAT EXCHANGE INSERT AND METHOD

Thomas R. Hornack, Lower Burrell, and Melvin H. Brown, Allegheny Township, Armstrong County, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 27, 1986, Ser. No. 879,619
Int. Cl.[4] F28F *1/40*
U.S. Cl. 165—179 **20 Claims**



1. A method of increasing the heat transfer of a fluid passing along a surface at a temperature of at least about 1,000° F. comprising:

(a) establishing a wire brush of wire or fiber positioned substantially normal to the flow of said fluid along said surface, wherein said wire or fiber comprises a material having an absorptance and an emittance of at least about 0.5; and

(b) providing a substantially unobstructed line of sight between said wire and said surface.

4,705,107

APPARATUS AND METHODS FOR CLEANING A WELL

Malcolm N. Council, Richardson, and Walter Baker, Lewisville, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 743,573, Jun. 11, 1985, abandoned. This application May 9, 1986, Ser. No. 861,417
Int. Cl.[4] E21B *37/02*; B08B *9/02*
U.S. Cl. 166—170 **12 Claims**

1. A system for cleaning the inside diameter of well tubulars comprising:

a. a tubing string disposed within the well tubular;

b. means for longitudinally moving the tubing string within the well tubular;

c. a fluid motor attached to the extreme end of the tubing string within the well tubular;

d. means for supplying power fluid to the fluid motor;

e. cutter head means rotatably attached to the fluid motor whereby the cutter head means can be operated to remove deposits from the inside diameter of the well tubular; and

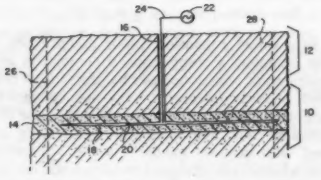
f. guide means attached to and extending downwardly from the cutter head means comprising a flexible drive shaft rotatably attached to and extending downwardly from the cutter head means and a universal joint connecting the flexible drive shaft to the guide means.

4,705,108

METHOD FOR IN SITU HEATING OF HYDROCARBONACEOUS FORMATIONS

William E. Little, Morgantown, W. Va., and Thomas R. McLendon, Laramie, Wyo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 27, 1986, Ser. No. 867,125
Int. Cl.[4] E21B *43/24, 43/267*
U.S. Cl. 166—248 **20 Claims**



1. A method for extracting valuable constituents from underground hydrocarbonaceous deposits such as oil shale comprising the steps of:

drilling a hole into but not beyond a stratum which contains a rich deposit of valuable constituents;

hydraulically fracturing the stratum which contains the deposit to form a single horizontally extending fracture plane located at the bottom of the hole;

injecting a liquid and conducting proppant into the fracture plane to form a horizontal liquid plate;

introducing electrical excitations to the stratum adjacent the liquid plate;

continuing the electrical excitation to retort the stratum along the liquid plate; and

recovering valuable constituents from the stratum adjacent the liquid plate.

4,705,109

CONTROLLED RETRACTING GASIFYING AGENT INJECTION POINT PROCESS FOR UCG SITES

Pierre Ledent, Tilff, and Claus Sonntag, Beaufays, both of Belgium, assignors to Institution pour le Developpement de la Gazeification Souterraine, Liege, Belgium

Filed Feb. 27, 1986, Ser. No. 834,625
Claims priority, application Belgium, Mar. 7, 1985, 0/214614
Int. Cl.[4] E21B *43/243, 47/06*
U.S. Cl. 166—251 **2 Claims**

1. In a process for the underground gasification of coal, wherein a gasification agent is introduced through at least one borehole into a coal seam and wherein gasification is effected of the coal of the seam with the gasification agent at a gasification region spaced from the point of injection, and gas produced by the gasification of said region is recovered, the improvement which comprises in combination the steps of:

(a) forming said borehole in said coal seam and lining said

borehole with perforated liners forming a tubing extending to a distal end of said borehole;

(b) plugging said tubing at said distal end;

(c) introducing said gasification agent through said tubing into said coal seam so that said gasification agent passes through perforations in said liners upstream of the plugged distal end of said tubing; and

(d) controlledly retracting said point along said borehole by:

(d_1) pneumatically injecting quantities of an inert granular material together with a thermosetting binder into said tubing at a cadence such that said tubing is progessively plugged from said distal end rearwardly and said point is retracted along said borehole, and

(d_2) controlling said cadence so as to maintain between the interior of said borehole and said region a pressure difference permitting said gasification agent to filter through the coal of said seam over a distance of meters between said point and said region.

4,705,110

PROCESS FOR INCREASING INJECTABILITY OF INJECTION WELLS IN OIL EXTRACTION BY MEANS OF WATER FLOODING

Dieter Balzer, Haltern, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Aug. 29, 1986, Ser. No. 901,702

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1985, 3531214

Int. Cl.[4] E21B *43/22*

U.S. Cl. 166—274 **16 Claims**

1. A process for increasing the injectability of an injection well used in the extraction of oil from a deposit by means of water flooding, comprising injecting in the well a solution, dispersion, or emulsion of a tenside and in the case of an emulsion also oils, in formation water or flooding water,

wherein the tenside is a mixture of 10–100 wt % of carboxymethylated oxethylates of the formula

$$R—O(C_3H_6O)_m(C_2H_4O)_nCH_2COOM, \text{ and}$$

0–90 wt % of (propoxy)ethoxylates of the formula

$$R—O(C_3H_6O)_m(C_2H_4O)_nH$$

wherein R is a hydrocarbon aliphatic group of 6–20 carbon atoms, a monolkyl-C_{6-10}-aromatic group of 3–18 carbon atoms in the alkyl group, or a di- or oligoalkyl-C_{6-10}-aromatic group of 1–16 carbon atoms per alkyl group, the total number of carbon atoms in the alkyl groups per molecule being 7–40; m is 0 to 20; n is 2 to 100; M is an alkali or alkaline earth metal ion or ammonium,

the tenside being selected such that the phase inversion temperature of the system: reservoir oil/formation water or flooding water/tenside/optional additives is at least 12° C. above the deposit temperature.

4,705,111

TUBING ASSEMBLY

Robert A. Bourg, Lafayette, La., assignor to Amoco Corporation, Chicago, Ill.

Filed Aug. 15, 1986, Ser. No. 896,996

Int. Cl.[4] E21B *29/10*

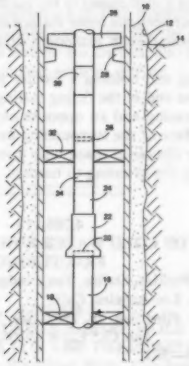
U.S. Cl. 166—277 **5 Claims**

1. A method for providing fluid communication and wireline access from a tubing string through a damaged or cut tubing remnant extending above an existing packer set within a casing, comprising:

(a) cutting the tubing extending above the existing packer in the casing;

(b) connecting a packer to the tubing string adjacent the lower end thereof;

(c) connecting a funnel guide to the lower end of the tubing string;



(d) lowering the tubing string with the packer and the funnel guide into the casing until an upper portion of the damaged or cut tubing remnant is received into a lower portion of the funnel guide; and

(e) actuating the packer to establish a sealed zone within the casing extending from the packer above the funnel guide to the tubing remnant packer.

4,705,112

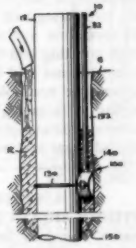
METHOD AND APPARATUS FOR EFFECTING AN OPENING IN A WELL CASING

Bernard A. Meadows, Rte. 4, P.O. Box 153, Elkton, Va. 22827

Filed Aug. 4, 1986, Ser. No. 892,870

Int. Cl.[4] E21B *29/06, 33/14, 41/00*

U.S. Cl. 166—285 **21 Claims**



1. A device for easily permitting effecting an opening in a well casing having a grouting wall therearound, comprising:

a tubular fitting having a circular transverse cross-section and having a first end and a second end, said first end configured to matingly engage the outer surface of the well casing, the length of said tubular fitting between said first and second ends thereof varying only very slightly over the circumference of said fitting, whereby the length of said tubular fitting between said first and said second ends thereof is substantially equal to the thickness of the grouting wall;

closure means over said second end; and

holding means attached to said tubular fitting for urging said first end of said first tubular fitting against the outer surface of the well casing and for holding said tubular fitting in position on the casing.

20. A method of providing a well casing to which access through surrounding grouting can be easily effected, said method comprising the steps of:

positioning a well casing in the earth with an open clearance space between the outer surface of the well casing and the surrounding earth extending downwardly from the surface;

positioning and holding a tubular fitting against the casing with one end of the fitting matingly engaging the surface of the casing and an opposite closed end being adjacent the surface of the surrounding earth;

filling the clearance space with grouting; and

permitting the grouting to harden.

4,705,113

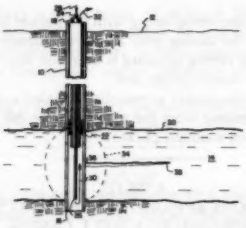
METHOD OF COLD WATER ENHANCED HYDRAULIC FRACTURING

Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 28, 1982, Ser. No. 425,343

Int. Cl.[4] **E21B** *36/00, 43/26*

U.S. Cl. 166—302 **2 Claims**



1. A method for fracturing a subterranean formation surrounding a borehole extending from the earth's surface to said formation comprising:

pumping a cooling fluid, having a temperature below the natural temperature of said formation, down a tubing in said borehole, circulating said fluid within said borehole adjacent said formation and returning said fluid to the surface without injecting said fluid into said formation for a time sufficient to cool said formation at least in those portions adjacent said borehole, and

thereafter pumping a fracturing fluid down said borehole and into said formation at a pressure sufficient to fracture said formation adjacent said borehole.

4,705,114

OFFSHORE HYDROCARBON PRODUCTION SYSTEM

Warren W. Schroeder, Aberdeen, Scotland, and Eric B. Turner, Hindhead, England, assignors to Texaco Limited, London, England

Filed Dec. 19, 1985, Ser. No. 810,617

Claims priority, application United Kingdom, Jul. 15, 1985, 8517760

Int. Cl.[4] **E21B** *43/017, 43/36*

U.S. Cl. 166—357 **4 Claims**

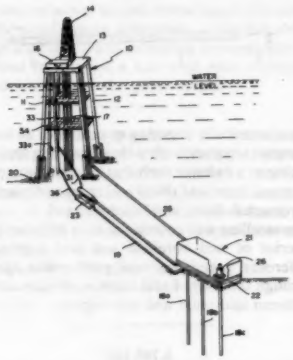
1. In an offshore marine structure having a jacket which supports a work deck above the surface of a body of water,

a fluid receiving means on said work deck for receiving liquid and vaporous hydrocarbons which are conducted thereto,

a pipeline on the floor of a body of water carrying a composite hydrocarbon stream including liquid and vaporous hydrocarbon,

subsea separating means at said marine structure communicated with said pipeline to receive said composite hydrocarbon stream, the combination therewith of,

a fluid conducting receptor column in said jacket defining a plurality of concentrically arranged discrete passages,



a first conductor means communicating one of said discrete passages with said subsea separating means and receiving a gaseous hydrocarbon stream therefrom,

second conductor means communicating another of said concentric passages with a source of liquid hydrocarbon at said subsea separating means, and

pumping means in said concentric passage which receives liquid hydrocarbons.

4,705,115

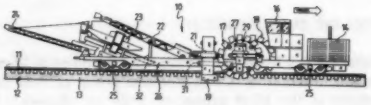
METHOD AND APPARATUS FOR RECONDITIONING BALLAST ALONG A RAILROAD TRACK

John B. Whitaker, Jr., Wetumpka, Ala., assignor to Kershaw Manufacturing Company, Inc., Montgomery, Ala.

Filed Mar. 31, 1986, Ser. No. 846,021

Int. Cl.[3] **E01B** *27/02*

U.S. Cl. 171—16 **14 Claims**



1. Method of reconditioning ballast along a railroad track bed utilizing means for removing ballast from the shoulder of said track bed, means for removing ballast from beneath said track, and means for recovering reuseable ballast all supported sequentially on a movable frame, comprising the steps of:

(a) removing ballast from the shoulder of said track as said frame moves along said track;

(b) conveying said ballast from the shoulder rearwardly along said frame;

(c) removing ballast from beneath said track rearwardly of said means for removing ballast from the shoulder of said track;

(d) conveying said ballast from beneath the track to said means for recovering ballast;

(e) depositing said ballast from the shoulder of said track beneath the center of said track rearwardly of said means for removing ballast from beneath said track; and

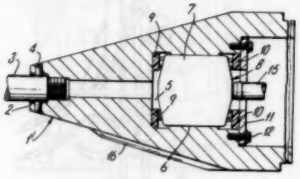
(f) depositing ballast recovered by said means for recovering beneath said track along the shoulder thereof.

4,705,116

MOLE WITH ROTARY VIBRATOR

Alec R. Carruthers, Westbury, England, assignor to ALH Systems, Ltd., England

Filed Nov. 12, 1985, Ser. No. 796,728
Int. Cl.[4] E21B *7/26*
U.S. Cl. 175—19 **3 Claims**



1. A method of breaking out an existing frangible lining of an underground, essentially horizontal duct, said method comprising:

using traction means to draw through a said duct a mole having a conical head which is oversized with respect to the diameter of the frangible duct lining;

using liquid pressure drive means to generate in a rotary vibrator in said mole high frequency rotational vibrations of said head; and

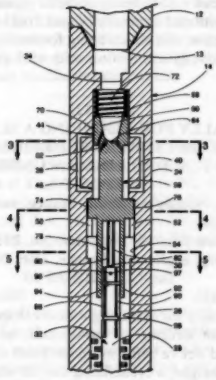
supplying power to the liquid pressure drive means from the traction means, whereby to break the duct lining by virture of said rotational vibrations.

4,705,117

METHOD AND APPARATUS FOR REDUCING DRILL BIT WEAR

Tommy M. Warren, Coweta; Warren J. Winters, and J. Ford Brett, both of Tulsa, all of Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Nov. 22, 1985, Ser. No. 801,167
Int. Cl.[4] E21B *4/02*; F03B *13/02*
U.S. Cl. 175—65 **21 Claims**



1. A method for using a drill bit of the type which is mounted on a rotor of a turbine suspended from a string of drill pipe comprising the steps of:

locking the rotor prior to lowering the turbine and drill bit into the wellbore to prevent rotation of the drill bit thereby reducing wear on the drill bit as the turbine and drill bit are lowered into the wellbore;

lowering the locked turbine and drill bit into the wellbore; and

unlocking the rotor of the turbine to permit rotation of the drill bit prior to drilling.

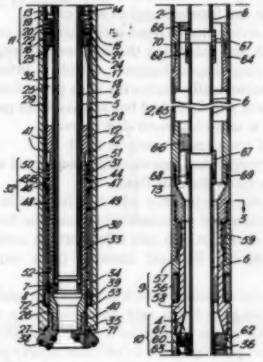
6. Apparatus for reducing wear on a drill bit of the type which is mountable on a rotor of a turbine, said rotor received within a turbine case, comprising a locking assembly capable of rotating relative to the turbine case, whereby the rotor can be locked as the turbine and drill bit are lowered into the wellbore and the rotor can be unlocked prior to drilling.

4,705,118

HAMMER FOR USE IN A BORE HOLE AND APPARATUS FOR USE THEREWITH

Melvyn S. J. Ennis, 19 Wynnland Park, Caramoney, County Antrim, Northern Ireland

PCT No. PCT/GB85/00104, § 371 Date Nov. 14, 1985, § 102(e) Date Nov. 14, 1985, PCT Pub. No. WO85/04212, PCT Pub. Date Sep. 26, 1985
PCT Filed Mar. 18, 1985, Ser. No. 803,403
Claims priority, application United Kingdom, Mar. 16, 1984, 8406957
Int. Cl.[4] E21B *4/02, 4/14*
U.S. Cl. 175—65 **18 Claims**



1. Apparatus for drilling a bore hole comprising a hammer and a dual walled drill tube, said hammer being mounted to one end of said tube, said hammer comprising a hammer piston reciprocably coupled to said hammer, fluid flow control means for directing fluid under pressure to said hammer to reciprocably drive said piston, cutting means rotatably coupled to said hammer, said cutting means rotating upon reciprocation of said hammer to cut said bore hole, thereby forming particulate material in said bore hole, ratchet means operatively coupled to said cutting means for permitting rotation of said cutting means in one direction only and preventing rotation in an opposite direction, and means for diverting a portion of said fluid under pressure to entrain and direct said particulate material to the surface of the bore hole.

4,705,119

ANNULAR AIR-HAMMER APPARATUS FOR DRILLING HOLES

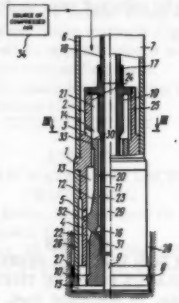
Alexandr D. Kostylev; Boris B. Danilov; Boris N. Smolyanitsky; Vladimir P. Boginsky, all of Novosibirsk; David I. Kogan, Moscow; Oleg V. Smirnov, Moscow, and Vyacheslav N. Saveliev, Moscow, all of U.S.S.R., assignors to Institut Gornogo Dela So An SSSR, Novosibirsk, U.S.S.R.

Filed Aug. 29, 1986, Ser. No. 901,943

Claims priority, application U.S.S.R., Sep. 16, 1985, 3955103

Int. Cl.[4] E21C *3/24*; E21B *4/14*

U.S. Cl. 175—92 **2 Claims**



1. An annular air-hammer apparatus for drilling holes comprising:

a hollow cylindrical case with a stepped bore

inlet ports provided in a step of a smaller inside diameter of said case

outlet ports provided in a step of a larger inside diameter of said case;

a rock-cutting tool which has an axial opening and is attached to the forward end of said case;

a chips-receiving sleeve fixed inside said case concentrically therewith and extending throughout full length thereof;

a stepped ring-shaped hammer which is fitted inside said case concentrically therewith with provision for reciprocating back and forth and has an axial bore passing therethrough is said chipsreceiving sleeve;

a source of compressed gaseous fluid;

a line for compressed gaseous fluid connected to said source of compressed gaseous fluid;

a working-stroke chamber which is formed in said case by said hammer and is connected to said line for compressed gaseous fluid through said inlet ports in order to provide motive power for said hammer on a working stroke thereof;

an idle-stroke chamber which is formed in said case by said rock-cutting tool and said chips-receiving sleeve and is connected to the bottom of a hole being drilled through said outlet ports in order to provide motive power for said hammer on an idle stroke thereof and admit spent air into the bottom hole for delivering chips upwardly through over said chipsreceiving sleeve;

a cylindrical protuberance of said chips-receiving sleeve at an upper end thereof which interacts with said hammer, when said hammer arrives into its topmost position, and separates said idle-stroke chamber into an upper space and a lower space, reducing thereby the pressure of the compressed gaseous fluid in said idle-stroke chamber;

a channeling means which is located in said idle-stroke chamber and in the step of the smaller inside diameter which faces an upper end face of said hammer and serves to connect said working-stroke chamber to said upper space of said idle-stroke chamber which is connected to said line for compressed gaseous fluid at the instant when said hammer is in its topmost position.

4,705,120

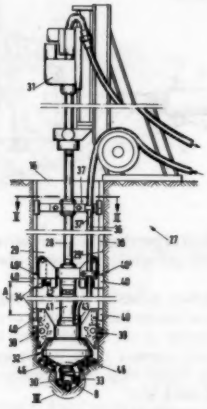
DRILLING MACHINE

Wolfgang Ebeling, Hannover, and Helmut Kolditz, Wolfenbüttel, both of Fed. Rep. of Germany, assignors to Turmag Turbo-Maschinen-AG, Nuesse & Graefer, Sprockhoevel and Gesellschaft fuer Strahlen-und Umweltsforschung Muenchen mbH (GSF), Neuherberg, both of, Fed. Rep. of Germany

Filed Sep. 2, 1986, Ser. No. 903,118

Int. Cl.[4] E21B *4/02*

U.S. Cl. 175—99 **21 Claims**



1. A drilling machine for drilling descending large boreholes in earth or rock structures, comprising an elongated drill pipe driven by a drive machine positioned outside a borehole being drilled; a drill head connected to said pipe; a support device for a drill head; a fluid-supplying device having a descending conduit supplying fluid from said fluid sypplying device to said drill head, said fluid being mixed in a region of said drill head with a material being drilled and forming a fluid-material mixture; an ascending conduit extending through said drill pipe and transporting said mixture from said drill head to a borehole mouth; and aa sluice (**30**) arranged in said drill head and receiving said mixture and connected to said ascending conduit for discharging said mixture thereto and driven by said drill pipe, said support device (**34**) being secured against rotation, said sluice being positioned centrally of said drill head and coaxially with said drill pipe, said sluice being formed by a bucket wheel which is in a driving connection with said drill pipe.

4,705,121

PIN, ESPECIALLY FOR CLAMPING A SLEEVE-SHAPED PROTECTOR OR CENTERING DEVICE ON ITS TUBE SERVING FOR DRILLING AN UNDERGROUND DEPOSIT

Eric J. Ancelle, Neuilly sur Seine, France, assignor to BECAP, Pantin, France

Filed Dec. 19, 1985, Ser. No. 813,858

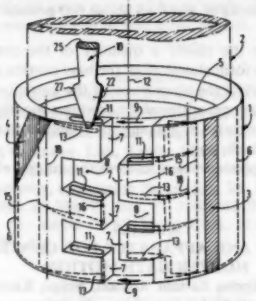
Claims priority, application France, Dec. 20, 1985, 84 19602

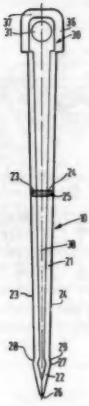
Int. Cl.[4] E21B *17/10*

U.S. Cl. 175—325 **8 Claims**

1. Pin, especially for clamping a sleeveshaped protector on a tube serving for drilling or production in an underground deposit, the said sleeve being moulded from rubber and having, over its entire height, a crenellated cut, of which the teeth and spaces facing one another alternately on the two edges of the cut match one another so that, as result of the interpenetration of the teeth in the spaces, the sleeve can be closed and clamped on the tube to be protected, the said sleeve being of the type with an embedded metal carcass which terminates, in each tooth of the sleeve, in a loop which extends over the entire

height of the tooth and the aperture of which is parallel to the axis of the sleeve and to the general direction of the cut, and the pin, to clamp the sleeve by penetrating all the loops of the carcass which are present on the two edges of the protector brought close to one another, being of the type with a trapezoi-





dal shank and being characterized in that the point of the shank has a gland in the form of an arrow tip having a base wider than the adjacent shank, and in that the edges of the shank on and at the rear of the gland are rounded and polished so as to have a minimum coefficient of friction.

4,705,122

CUTTER ASSEMBLIES FOR ROTARY DRILL BITS

Michael T. Wardley, Stroud, and David N. Shirley-Fisher, Cheltenham, both of England, assignors to NL Petroleum Products Limited, Gloucestershire, United Kingdom

Filed Jan. 14, 1986, Ser. No. 818,628

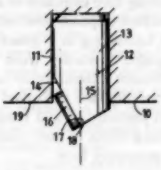
Claims priority, application United Kingdom, Jan. 15, 1985, 8500925

Int. Cl.[4] E21B *10/46*

U.S. Cl. 175—329 **18 Claims**

1. A rotary drill bit comprising a bit body formed over the surface thereof with a plurality of generally cylindrical sockets, there being mounted within each socket a cutter assembly comprising a generally cylindrical stud, one end portion of the stud being received and secured within the socket and an opposite end portion of the stud projecting from the socket, said projecting portion of the stud being formed with a plane surface inclined at an angle of less than 90° to the longitudinal axis of the stud and a preform cutting element being mounted on said surface, the dimensions of the cutting element, and its location on said surface, being such that no part of the cutting element projects beyond the peripheral surface of the stud as viewed axially thereof, the cutting element having a portion thereof disposed within the socket and at least that part of the stud which lies rearwardly of said portion of the cutting element, with respect to the normal direction of movement of the cutter assembly in use during drilling, engages and is supported by an internal surface of the socket.

14. A method of manufacturing a cutter assembly, for a rotary drill bit, of the kind comprising a generally cylindrical



stud to be received in a socket in the surface of the bit body, the stud being formed, adjacent one end thereof, with a plane surface inclined at an angle of less than 90° to the longitudinal axis of the stud, and a preform cutting element mounted on said surface, the method comprising the steps of mounting the cutting element on the inclined surface on the stud in such location that at least one portion of the cutting element projects beyond the peripheral surface of the stud as viewed axially thereof, and then removing said projecting portion of the cutting element.

4,705,123

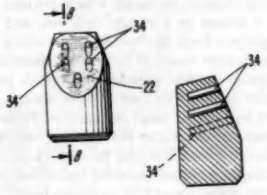
CUTTING ELEMENT FOR A ROTARY DRILL BIT AND METHOD FOR MAKING SAME

Mahlon D. Dennis, Kingwood, Tex., assignor to Strata Bit Corporation, Houston, Tex.

Filed Jul. 29, 1986, Ser. No. 890,285

Int. Cl.[4] E21B *10/46*

U.S. Cl. 175—410 **21 Claims**



1. A cutting element of the type comprising a generally cylindrical shank defining a front-to-rear extending longitudinal axis and having a mounting face disposed at a front end of said shank, and a cutting blank mounted on said mounting face, said blank comprising a substrate having a base surface and a cutting surface, the improvement wherein said shank comprises:

a body formed of a ductile material and defining an outer generally cylindrical side surface, and a rear surface opposite said mounting face, and

at least one stiffening element formed of a hard material embedded in said body and extending in a generally front-to-rear direction, said at least one element spaced inwardly from said rear surface and extending to said mounting face such that said mounting face is formed partially of said ductile material and partially of said hard material, said base surface of said substrate being bonded

to both said ductile and hard materials of said mounting face.

17. A method of making a cutting element comprising the steps of:

providing at least one stiffening element formed of a hard material,

at least partially coating said stiffening elements with a high temperature-resistant material,

casting a body from a ductile material with said stiffening element embedded therein, said body formed with a generally cylindrical outer surface defining a longitudinal axis, a mounting face disposed at a front end of said body, and a rear surface opposite said mounting face, said stiffening element extending in a generally front-to-rear direction and spaced inwardly from said side surface, said stiffening element extending to said mounting face such that said mounting face is formed partially of said ductile material and partially of said hard material, and

bonding a cutting blank to both said ductile and hard material of said mounting face.

4,705,124

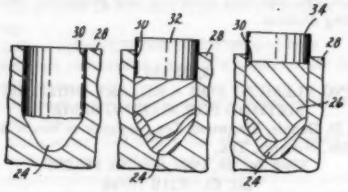
CUTTING ELEMENT WITH WEAR RESISTANT CROWN

Gerald R. Abrahamson, White Bear Lake, Minn., and Ernest J. Duwell, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 22, 1986, Ser. No. 899,529

Int. Cl.[4] B21K *5/02;* **C04B** *35/56;* **E21B** *10/58*

U.S. Cl. 175—410 **6 Claims**



1. A cutting element including a base portion adapted to be inserted in a socket in a rotary drill bit, and a tip portion adapted to project from the socket, said cutting element comprising a tough core material formed by sintering a core mixture of tungsten carbide powder and cobalt powder, which cobalt powder forms about twelve to seventeen percent of the core mixture by weight, said core material forming the majority of said base portion and an inner part of said tip portion, and a wear resistant crown material formed by sintering a crown mixture of tungsten carbide powder and cobalt powder, which cobalt powder forms about four to eleven percent of the crown mixture by weight, said crown material covering said inner part and defining at least the majority of the outer surface of said tip portion, the interface between said core material and said crown material being free of voids and being visually irregular along its length when said tip portion is cross sectioned and viewed at a magnification of about sixty-five times so that said crown material is firmly retained on said inner part during cutting of rock.

5. A method for forming a cutting element having a base portion adapted to be inserted in a socket in a rotary drill bit and a tip portion adapted to project from the socket, said method comprising:

mixing a crown mixture of tungsten carbide powder and cobalt powder with the cobalt powder forming in the range of about four to eleven percent of the mixture by weight;

mixing a core mixture of tungsten carbide powder and cobalt powder with the cobalt powder forming in the range of about twelve to seventeen percent of the mixture;

providing a die having a cavity approximately the shape of the cutting element to be formed;

positioning in the cavity a quantity of the crown mixture in the shape of a crown defining at least a major portion of the outer surface for the tip portion of the cutting element using a pressure of less than about 600 pounds per square inch;

positioning in the cavity a quantity of the core mixture sufficient to form almost all of the base portion and at least an inner part of the tip portion of the cutting element;

pressing the two quantities of the mixtures together and into the die at pressures in the range of about ten to fifteen tons per square inch; and

sintering the pressed insert to form the cutting element.

4,705,125

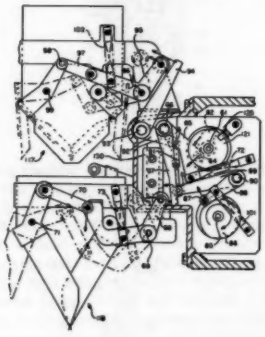
METHOD OF AND APPARATUS FOR CONTROLLING HOPPER GATE MOTION

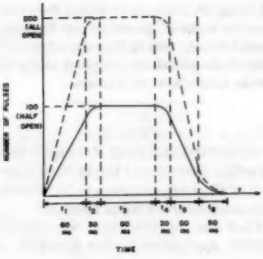
Seiji Yamada, Kyoto; Satoshi Konishi, Shiga; Katsuaki Kono, Shiga, and Ryoji Nishimura, Shiga, all of Japan, assignors to Ishida Scales Manufacturing Company, Ltd., Kyoto, Japan

Filed Nov. 14, 1986, Ser. No. 931,218

Int. Cl.[4] G01G *13/16, 13/34;* **B67D** *3/00;* **B65D** *47/00*

U.S. Cl. 177—25 **16 Claims**





13. In a combinational weighing system comprising

a plurality of article batch handling units each serving to receive an article batch, to output a weight value signal indicative of the weight of said article batch, and to discharge said article batch in response to a discharge signal, each article batch handling unit including one or more hoppers with gates, and

a control means serving to periodically carryout combinational computation on the basis of inputted weight values, to thereby select at least one combination of article batch

handling units and to output discharge signals to said selected article batch handling units,

the improvement wherein said control means controls the motion of said gate by sequentially transmitting a series of pulse signals according to a preset program, and wherein each of said gates is moved by an angle and in a direction in response to each of said pulse signals.

4,705,126

SIGNAL PROCESSING CIRCUIT AND WEIGHING APPARATUS INCORPORATING SAME

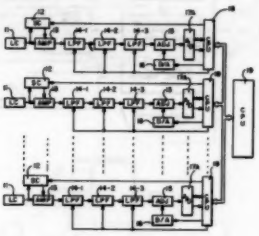
Kazufumi Naito, Ohtsu, Japan, assignor to Ishida Scales Manufacturing Company, Ltd., Kyoto, Japan

Filed Sep. 10, 1986, Ser. No. 905,876

Claims priority, application Japan, Sep. 24, 1985, 60-210565; Nov. 18, 1985, 60-258379; Dec. 27, 1985, 60-298746

Int. Cl.[4] G01G *19/52, 23/10;* **G01L** *25/00, 1/22*

U.S. Cl. 177—50 **42 Claims**



1. A signal processing circuit for a weighing system comprising

an amplifier circuit for amplifying a weight signal outputted from a weighing device,

an active filter which serves to attenuate noise components in said weight signal, and

switching means for selectably switching between a filter mode of operation wherein said active filter functions as a filter and a buffer mode of operation wherein said active filter functions as a buffer.

4,705,127

CAPACITY-TYPE POSITION SENSOR FOR ELECTROMAGNETIC LOAD-COMPENSATION WEIGHING APPARATUS

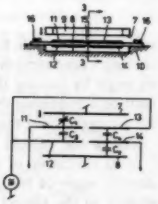
Peter Kunz, Saumstrasse 28, CH-8625 Gossau, Switzerland

Filed Mar. 13, 1987, Ser. No. 25,584

Claims priority, application Switzerland, Apr. 15, 1986, 1493/86

Int. Cl.[4] G01G *7/00, 3/14*

U.S. Cl. 177—212 **8 Claims**



1. In a weighing apparatus of the electromagnetic load-compensation type operable to bias a movable load-responsive member (9) toward a zero position relative to a stationary frame member (10), said movable and stationary members defining a pair of parallel spaced planar electrodes (7,8) each at ground potential; the improvement which comprises: variable-capacitance position sensing means for generating a position-responsive electrical signal that is a function of the displacement of the movable member from its normal zero position, including:

(a) at least two pairs of coplanar spaced capacitive electrodes (11, 13,; 12, 14) mounted in successively spaced opposed parallel relation between said movable and stationary electrodes, respectively, a first electrode (11) of one pair defining a first capacity (C_1) relative to the movable electrode and a third capacity (C_3) relative to the opposed second electrode (12) of the other pair, whereby said first and third capacities define a first capacitive voltage divider, the remaining electrode (14) of said other pair constituting a third electrode defining a second capacity (C_2) relative to the stationary electrode, and a fourth capacity (C_4) relative to the opposed fourth electrode, whereby said second and fourth capacities define a second capacitive voltage divider;

(b) means connecting said second and fourth electrodes with one terminal of an alternating-current voltage source (19), the other terminal of said source being connected with ground, whereby said first and second capacitive voltage dividers are connected to define a capacitive bridge network; and

(c) output means connected with said first and third electrodes and thus with the center points (17, 18) of said capacitive voltage dividers for supplying said position-responsive signal.

4,705,128

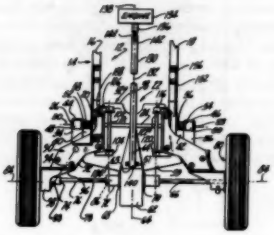
INDEPENDENT WHEEL SUSPENSION SYSTEM HAVING A DIFFERENTIAL PIVOTABLE ABOUT TWO AXES

Werner Krude, Grosse Pointe Park, Mich., assignor to GKN Automotive Components Inc., Southfield, Mich.

Filed Mar. 5, 1984, Ser. No. 586,054

Int. Cl.[4] B60K *20/00*

U.S. Cl. 180—73.3 **13 Claims**



1. An independent wheel suspension system for a vehicle having a chassis, vehicle support means for supporting said chassis for displacement relative to a driving surface, a pair of laterally spaced-apart wheel assemblies, each having a wheel rotatable about a wheel rotation axis, an engine having an engine output adapted to provide a driving torque about an engine output axis, said independent wheel suspension system comprising:

transverse support means rotatably connected to said vehicle support means to pivot about a transverse pivot axis;

a differential mounted to said transverse support means adapted to pivot therewith about said transverse pivot axis, said differential having a differential input adapted to receive said driving torque about a differential input axis and to redirect said driving torque to a differential output about a differential output axis substantially parallel to said transverse pivot axis; and

a pair of arm means each coupling one of said pair of wheel

assemblies and said transverse support means, each of said pair of arm means having a wheel end coupled to said one wheel assembly and a pair of spaced apart support sections establishing a swing axis therebetween, each said support section being pivotably coupled to said transverse support means so as to establish said swing axis substantially perpendicular to said wheel axis;

whereby a first relative movement is allowed about said swing axis between said differential and each said wheel assembly while a second relative movement is allowed about said transverse pivot axis between said vehicle support means and both said differential and said wheel assemblies.

4,705,129

HYDROSTATIC STEERING ARRANGEMENT, ESPECIALLY FOR MOTOR VEHICLES

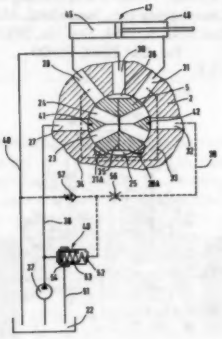
Rolf Fassbender, Mutlangen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Mar. 21, 1986, Ser. No. 842,292

Claims priority, application PCT Int'l. Appl., Feb. 23, 1985, PCT/EP8500123

Int. Cl.[4] B62D *5/08*

U.S. Cl. 180—132 **15 Claims**



1. In a hydrostatic steering system for automotive vehicles or the like, having a steering control member, a pump, a fluid reservoir and a servomotor with opposed pressure chambers, the improvement comprising a rotatable valve body **(5)** drivingly connected to the steering control member, a valve housing **(2)** directly journaling the valve body, centering means **(8, 10–13)** operatively connected to the valve body for yieldably resisting angular displacement thereof from a neutral position, a pair of intersecting connecting passages **(23, 24)** extending diametrically through the valve body, a pair of peripheral recesses **(25, 26)** formed in the valve body in spaced relation to said connecting passages and a plurality of distributor passages **(27, 28, 30, 31, 32)** formed in the housing extending from the valve body in the neutral position between the connecting passages and in spaced relation to the recesses to the pump, the reservoir and the pressure chambers of the servomotor, respectively.

4,705,130

METHOD OF CONTROLLING VEHICLE

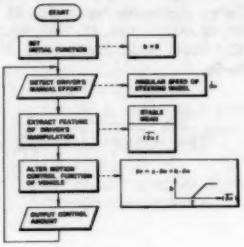
Yukio Fukunaga, Zushi; Yasuji Shibahata; Kenji Nakamura, both of Yokohama; Yasumasa Tsubota, Yokosuka; Namio Irie, and Junsuke Kuroki, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

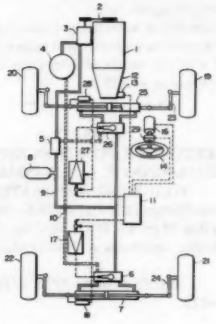
Filed Jan. 28, 1985, Ser. No. 695,228

Claims priority, application Japan, Jan. 31, 1984, 59-15336

Int. Cl.[4] B62D *5/04, 5/06*

U.S. Cl. 180—140 **10 Claims**





1. A method of controlling a vehicle having a steering wheel and road wheels including a predetermined pair of road wheels steerable at a steered angle by turning the steering wheel to a turned angle, said method comprising the steps of:

extracting a feature averaged over time indicative of a driver's technique steering the vehicle and generating a feature indicative signal indicative of the feature extracted;

controlling the steered angle of the predetermined pair of road wheels relative to the turned angle of the steering wheel at a predetermined ratio; and

varying said predetermined ratio of the steered angle of the predetermined pair of road wheels to the turned angle of the steering wheel in response to the feature indicative signal.

4,705,131

FOUR-WHEEL STEERING CONTROL SYSTEM FOR VEHICLE

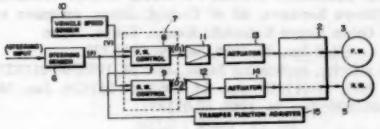
Yasuji Shibahata, Yokohama; Yukio Fukunaga, Zushi; Kenji Nakamura, Yokohama; Yasumasa Tsubota, Yokosuka; Namio Irie, and Junsuke Kuroki, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

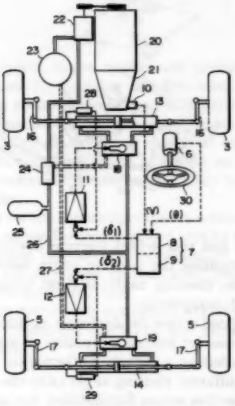
Filed Jan. 28, 1985, Ser. No. 695,345

Claims priority, application Japan, Jan. 31, 1984, 59-15342

Int. Cl.[4] B62D *5/04, 5/06*

U.S. Cl. 180—140 **24 Claims**





1. A steering system for a vehicle having at least steerable front wheels comprising:

steering input means comprising a steering wheel and a steering sensor for determining a steering input which is an angular displacement of the steering wheel,

front steering means connected with the steering input means for determining a first output angle from the steering input in accordance with a first transfer characteristic between the steering input and the first output angle and controlling a steering angle of the front wheels so that the steering angle of the front wheels is maintained equal to the first output angle, the first transfer characteristic being a function of steering frequency such that both the gain and phase difference of the first transfer characteristic vary as the steering frequency varies, and

rear steering means connected with the steering input means for determining a second output angle from the steering input in accordance with a second transfer characteristic between the steering input and the second output angle which is different from the first transfer characteristic, and controlling a steering angle of the rear wheels so that the steering angle of the rear wheels is maintained equal to the second output angle.

4,705,132

POWER STEERING GEAR

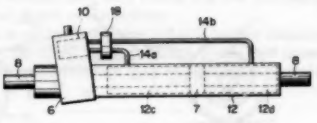
Masuo Tsuchiya, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Oct. 15, 1985, Ser. No. 787,097

Claims priority, application Japan, Nov. 12, 1984, 59-171150[U]

Int. Cl.[4] B62D *5/08*

U.S. Cl. 180—148 **2 Claims**



1. A power steering gear arrangement for a vehicle having a power cylinder operatively coupled to a steering rack, and a control valve linked to a steering wheel, comprising:

(a) oil passage means positioned between and communicating with said control valve and said power cylinder,

(b) means located in said oil passage means for variably restricting the flow of oil between said control valve and said power cylinder, said restricting means including restriction orifice means permitting a continuous, limited amount of flow of oil to said power cylinder when power steering assist is not necessary, for attenuating kickback input and vibration, and substantially and quickly increasing such oil flow when hydraulic pressure in the control valve increase in response to the need for power steering assist, and wherein

(c) said variable restricting means comprises a spool valve including an axially movable spool, the longitudinal positioning of which controls the flow of oil through said oil passage means from said control valve to said power cylinder, pressure chambers located at each end of said spool, said control valve having supply and return ports communicating with said pressure chambers, means for biasing each end of said spool to a rest position in which the flow of oil to said power cylinder is minimized,

whereby increased oil pressure in said control valve due to steering function results in increased flow to one of said pressure chambers, thereby increasing the pressure in such chamber relative to the other of said chambers, said spool being moved longitudinally as a result of such pressure differential to increase the flow crosssection through said passage means and consequently the flow to said power cylinder to assist the steering movement.

4,705,133

TAG AXLE ASSEMBLY FOR WORK VEHICLE

Ronald E. Christenson, Mantorville, and Garwin B. McNeilus, Dodge Center, both of Minn., assignors to McNeilus Truck and Manufacturing, Inc., Dodge Center, Minn.

Filed Jan. 23, 1987, Ser. No. 6,217

Int. Cl.[4] B62D *61/12;* **B62K** *13/00*

U.S. Cl. 180—209 **11 Claims**

1. In combination with a truck of the type having a longitudinally extending frame including first and second spaced-apart side members supported on a plurality of transversely extending axles, said axles each having one or more wheels affixed to the opposite end thereof, a hydraulically actuatable tag axle assembly comprising:

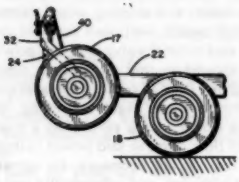
(a) first and second articulated arm means, each pivotally attached at one end thereof to said first and second side members of said frame proximate the rear end of said frame members;

(b) first and second stub axle means extending perpendicularly outward from said first and second articulated arm means, respectively;

(c) further wheel means journal for rotation on said first and second stub axle means;

(d) a drop axle, joined between said first and second articulated arm means, said drop axle including a transversely extending bar of length sufficient to span the width dimension of said frame and offset from the rotational axis of said wheels;

(e) hydraulic actuator means operatively coupled to said articulated arm means and to said frame for moving said



further wheel means between a ground-engaging disposition rearward of the ends of said first and second side members of said frame and an elevated disposition wherein said wheel means straddle the rear portion of said first and second side members of said frame; and

(f) non-extendible means for guiding the pivotal movement of said first and second articulated arm means during said movement of said further wheel means between said ground-engaging disposition and said elevated disposition.

4,705,134

SYSTEM FOR CONTROLLING A TRANSFER CLUTCH OF A FOUR-WHEEL DRIVE VEHICLE

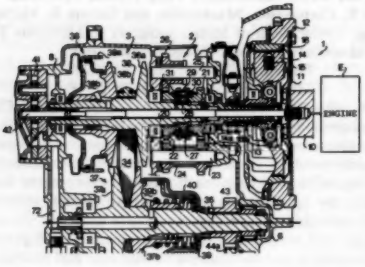
Nobumitsu Kitade, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1986, Ser. No. 855,056

Claims priority, application Japan, Apr. 30, 1985, 60-92971; Apr. 30, 1985, 60-92972; Apr. 30, 1985, 60-92980

Int. Cl.[4] B60K *17/34*

U.S. Cl. 180—233 **9 Claims**



1. A control system for a four-wheel drive vehicle having an engine, a transmission, a main clutch for transmitting the output of the engine to the transmission, main drive wheels operatively connected to an output shaft of the transmission, auxiliary drive wheels, and a transfer clutch for transmitting output of the transmission to the auxiliary drive wheels, the system comprising:

detector means for detecing whether the main clutch is in partial engagement state or entire engagement state and for producing a clutch condition signal representing a clutch condition;

control means responsive to the clutch condition signal for controlling torque capacity of the transfer clutch so as to slip the transfer clutch in dependency on the main clutch condition.

4,705,135

FRONT AND REAR WHEEL STEERING DEVICE

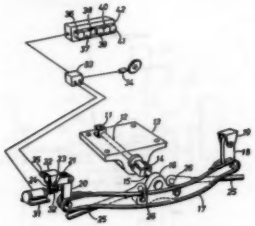
Yoshimichi Kawamoto; Yoshimi Furukawa; Tetsuro Hamada, and Mitsuya Serizawa, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1986, Ser. No. 822,293

Claims priority, application Japan, Jan. 24, 1985, 60-011827; Jan. 24, 1985, 60-011828; Jan. 24, 1985, 60-011829; Jan. 24, 1985, 60-011830; Jan. 24, 1985, 60-011831

Int. Cl.[4] B60K *17/358*

U.S. Cl. 180—236 **9 Claims**



1. A front and rear wheel steering device for vehicle for variably controlling the steering angle ratio of rear wheels relative to the steering angle of front wheels according to vehicle speed, comprising:

a vehicle speed sensor for detecting an actual vehicle speed;

storage means for storing a plurality of mathematical functions, including a default mathematical function, representing different steering angle ratio characteristics;

manual selection means for selecting one of the mathematical functions of the vehicle speed stored in the storage means;

means for achieving a steering angle ratio according to the mathematical function selected on the manual selection means;

limiting means which prohibits the manual selection of the mathematical functions other than the default mathematical function according to a predetermined vehicle condition.

4,705,136

MOTOR VEHICLE SAFETY SYSTEM

Donald E. Godsoe, Sr., and Donald E. Godsoe, Jr., both of 76 Lexington St., Auburndale, Mass. 02166

Filed Apr. 2, 1986, Ser. No. 847,424

Int. Cl.[4] B60R *21/34*

U.S. Cl. 180—277 **19 Claims**

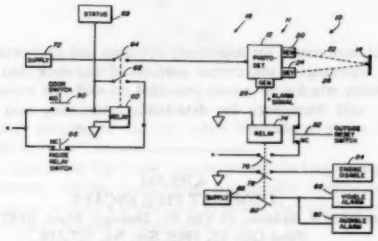
10. A school bus safety system for monitoring the area underneath a school bus between the front door and rear tire, said system comprising:

(a) photodetecting means including beam generator means, detector means and alarm generator means, said beam generator means generating a light beam, said detector means sensing interruptions in said light beam, said alarm

generator means generating an alarm signal when interruptions in said light beam are sensed by said detector means, said generator means and said detector means positioned to monitor the area between the front door and the rear wheels of the school bus;

(b) first switch means responsive to the opening of the front door, said first switch means having opened and closed states, said first switch activating said photodetector means when the front door is opened;

(c) first relay means responsive to said first switch means, said first relay means having energized and deenergized states, said first relay being energized when the front door is opened, said first relay means including first holding contacts for maintaining said first relay means in said energized state;



(d) first reset switch means operatively connected to said first relay means for resetting said first relay means;

(e) second relay means responsive to said alarm signal, said first relay means having energized and deenergized states, said second relay means being energized by said alarm signal, said second relay means including second holding contacts for maintaining said second relay means in said energized state;

(f) second reset switch means operatively connected to said second relay means for resetting said second relay means;

(g) warning means operatively connected to said second relay means for providing an indication that said alarm signal has been generated; and

(h) disable means operatively connected to said second relay means for disabling the bus when said alarm signal has been generated.

4,705,137

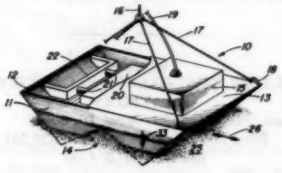
MARINE SHEAR WAVE VIBRATOR

Delbert W. Fair, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Continuation of Ser. No. 212,912, Dec. 4, 1980, abandoned. This application Jun. 1, 1983, Ser. No. 499,023

Int. Cl.[4] G01V *1/053, 1/047*

U.S. Cl. 181—120 **6 Claims**



1. An underwater vibrator apparatus for dispositon on the sea bottom to generate a shear wave seismic signal therein, comprising:

a housing consisting of a top panel and a bottom enclosure that is formed to include at least two wedge-shaped portions having downwardly directed apices and oppositely disposed, angularly oriented first and second end walls adjacent the respective apices;

at least one shaft rigidly secured within said housing bottom enclosure between said first and second end walls;

reaction mass means movably retained on said at least one shaft for reciprocal movement; and

means for oscillating said reactin mass means on said at least one shaft such that said bottom enclosure continually couples shear wave energy into the sea bottom for a duration as the bottom enclosure settles into the increasingly consolidated depth of sea bottom.

6. Apparatus as set forth in claim 1 that is further characterized to include two shafts rigidly secured within said housing bottom and having said reaction mass means movably retained thereon.

4,705,138

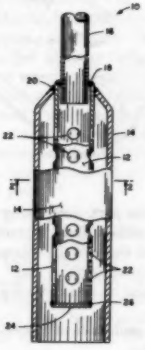
STEAM TRAP MUFFLER

Norman W. Reese, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 24, 1985, Ser. No. 813,190

Int. Cl.[4] F01N *1/08*

U.S. Cl. 181—212 **4 Claims**



1. A steam trap muffler adapted for connecting to an exhaust end of an exhaust conduit of a steam trap comprising:

A. a first expansion conduit to allow the expansion of steam and the expansion of condensate flashing to steam as the steam and condensate surge from the exhaust end of the exhaust conduit of the steam trap; said first expansion conduit having a first end capable of being fixedly connected to the exhaust end of the exhaust conduit of the steam trap and a second end being at least substantially capped; said first expansion conduit having a substantially uniformly sized interior cross-sectional area along its length with said cross-section area being from about three to about nine times greater than the interior cross-sectional area of the exhaust conduit of the steam trap; said first expansion conduit having orifices through it to allow condensate and steam to flow out of said first expansion conduit; said orifices being suficient in number and size so that the sum of the area of their individual openings is from about three to about nine times the area of the interior of the cross-section of said first expansion conduit; and

B. a second expansion conduit having a first end and a second end; which has an interior cross-sectional area which is from about three to about nine times as large as the interior cross-section area of the first expansion conduit; which is substantially annularly disposed around the first expansion conduit; said first end of the second expansion conduit sealably and fixedly connected to the first end of the first expansion conduit; said second end of the second

expansion conduit open to the surrounding atmosphere so as to be capable of allowing the surges of steam and condensate which intermittently escape from steam traps to escape to the atmosphere in a much less noiseful fashion so as not to frighten personnel in the immediate vicinity of the steam trap and also to essentially prevent erosion of the ground which occurs because most steam trap exhaust pipes are directed toward the ground to protect personnel.

4,705,139

SOUND INSULATION PART FOR SURFACES

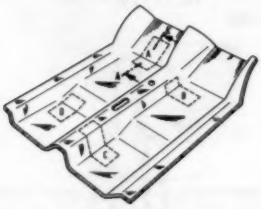
Heinemann Gahlau, Celle; Manfred Hoffmann, Nienhof, and Norbert Seemann, Nienhagen, all of Fed. Rep. of Germany, assignors to Dr. Alois Stankiewicz GmbH, Adelheidsdorf, Fed. Rep. of Germany

Filed Sep. 8, 1986, Ser. No. 904,902

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1985, 3531886

Int. Cl.[4] E04B *1/82*

U.S. Cl. 181—290 **11 Claims**



1. A sound insulation part, comprising:

a body made of a resilient foam material, substantially defining the size and shape of the souond insulation part, and including an outward surface; and

a cover layer secured on and covering the outward surface of the body;

the body forming a multitude of spaced cells inside the body, each cell including

(i) an interior and an outside surface extending completely around said interior,

(ii) flexible, gas impermeable foil held against the outside surface of the cell, and extending completely around and completely enclosing the interior of the cell, and

(iii) a supply of gas captured by the foil in the interior of the cell;

the cells conducting sound at a rate faster than the rate at which the body conducts sound, wherein the cells convert sound sources into sound sinks.

4,705,140

SAFETY CAGE FOR ATTENDING TO LOCKS ON CARGO CONTAINERS

Jerry W. Dudley, Seal Beach, and Patrick J. Andrich, Redondo Beach, both of Calif., assignors to Metropolitan Stevedore Company, Wilmington, Calif.

Filed Mar. 19, 1987, Ser. No. 28,124

Int. Cl.[4] A62B *35/00;* **E04G** *3/12*

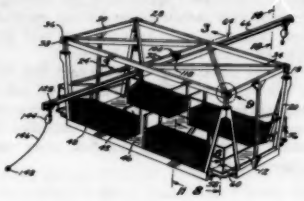
U.S. Cl. 182—3 **20 Claims**

1. A safety cage adapted to be hoisted atop a plurality of interlockable cargo containers to provide safe access to locks in upper corners of the containers, comprising:

a substantially rectangular framework including a deck and side members extending upright from said deck, said framework having width and length dimensions substantially identical to corresponding dimensions of said cargo containers,

said deck having a perimeter region, an interior region and corner portions, said corner portions having openings formed therein,

barrier means disposed along said perimeter regions for substantially enclosing said interior region of said deck,



closure means for selectively covering and uncovering said openings in said corner portions of said deck, and

hoist attachment means provided on said side members of said framework for detachably connecting said framework to a hoist.

4,705,141

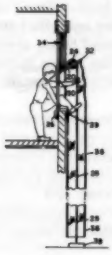
COMPACT FIRE ESCAPE

Constance K. Splaine, 69 Elm St., Danvers, Mass. 01923

Filed Oct. 15, 1985, Ser. No. 787,318

Int. Cl.[4] A62B *1/20*

U.S. Cl. 182—48 **7 Claims**



1. A fire escape comprising, a portal frame, said frame having an upper portion which projects forward of the lower portion of said portal frame, a descent filament mounted to an outer part of said upper portion, a flexible woven tube attached at the inner side thereof to said frame at said lower portion and attached at the outer side thereof to said frame at said upper portion, sized to permit passage of a person therethrough, said filament being held by said outer part outwardly of the inner side of said tube and extending at least partially through said tube.

4,705,142

CHAIR LIFT WITH CARRYING CASE FORMING PLATFORM

Carl Peterson, 7456 Main St., Niles, Ill. 60648

Filed Feb. 12, 1986, Ser. No. 828,531

Int. Cl.[4] A62B *1/00*

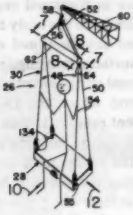
U.S. Cl. 182—150 **14 Claims**

1. A chair lift comprising,

a rigid box having a carrying handle serving alternatively as a portable container and as a platform, and including a rigid body having a panel forming a bottom of the box and with the outer surface of the bottom being used as a seat of the platform, the body also having surrounding side walls and an open side opposite said panel,

the box acting as a container being adapted to receive nearly all the other elements of the chair lift, and including a rigid closure element detachably mountable on the body over the open side thereof, the box, with the closure element secured to the body, forming a complete enclosure entirely enclosing the other elements when in place therein,

a pair of rope members each including a loop and a pair of legs having free ends, the free ends of the legs being de-



tachably secured to the box when the box serves as a platform,

the free ends of the legs being lowermost and the loops being uppermost, and the loops being positionable relative to each other to form a single loop to mount the chair lift on and suspend it from a lifting hook, and

the chair lift further including a spreader bar between the rope members.

4,705,143

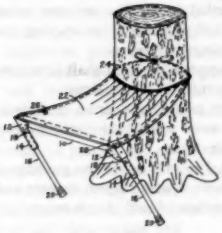
DEER HUNTER'S TREE SEAT

Anthony Ziemba, 2110 Providence Ct., Eau Claire, Wis. 54703

Filed May 4, 1987, Ser. No. 45,436

Int. Cl.[4] A01M *31/02*

U.S. Cl. 182—187 **1 Claim**



1. A portable lightweight seat, that is attached to a tree, to be used primarily by deer hunters comprising:

a. a tubular horizontal member, preferably aluminum, with an elongated support leg attached to each end of said horizontal member by a pivotal connection

b. a sturdy, flexible, lightweight fabric, having one end of said fabric attached to said horizontal member

c. a flexible cord fastened to semi-circular end of said fabric, whereby seat assembly is attached to a tree.

4,705,144

SPRING OPERATING MECHANISM FOR A CIRCUIT INTERRUPTER

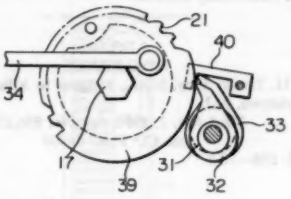
Kiyoshi Yabe, and Akiyoshi Onuma, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Amagasaki, Japan

Filed Jun. 16, 1986, Ser. No. 874,695

Claims priority, application Japan, Jun. 17, 1985, 60-130043

Int. Cl.[4] G05G *17/00;* **F03G** *1/00;* **F16H** *29/02*

U.S. Cl. 185—40 R **1 Claim**



1. A spring operating mechanism for a circuit interrupter comprising at least one pawl having a tip, means for effecting a rocking motion of said pawl, a ratchet wheel having teeth for being engaged by said pawl and an outer circumferential toothless portion having a larger diameter than the diameter at the teeth, said ratchet wheel being rotated by the rocking motion of said pawl, a closing spring which is charged by the rotation of said ratchet wheel, and a catch arranged to come into engagement with the tip of said pawl when the tip of said pawl rides on said outer circumferential toothless portion of said ratchet wheel and to be brought out of said engagement by the rocking motion of said pawl.

4,705,145

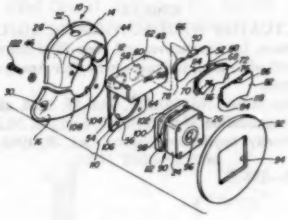
DISC BRAKES

Joseph F. Goulart, Union Lake, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed May 5, 1986, Ser. No. 859,567

Int. Cl.[4] F16D *55/224, 69/04*

U.S. Cl. 188—18 A **4 Claims**



1. A disc brake comprising a self-contained wheel bearing including a casing, axle structure extending into the casing and bearing structure within the casing rotatably supporting the casing on the axle structure, means for connecting the casing to a wheel, a steering knuckle, the axle structure being connected to the steering knuckle, brake cylinder structure extending outwardly from the steering knuckle, a brake plate having brake piston structure operatively engaging the brake cylinder structure, a first brake pad structure, brake pad support means including a plate member having brake cylinder opening means, said brake cylinder structure passing through said brake cylinder opening means, a bridge member extending from the brake pad support means plate member and away from the steering knuckle, a bent-over portion extending from the bridge portion, said bent-over portion having brake pad struc-

ture opening means therein, a second brake pad structure having hook means received in said brake pad structure opening means to connect the second brake pad structure to the brake pad support means, said brake plate having a notch in one edge thereof, said first brake pad structure having hook means received in said notch to connect the first brake pad structure to the brake plate, the bearing casing having an angular peripheral outer configuration, a brake disc having a central opening with a mating angular peripheral configuration received on the bearing casing in non-rotatable but axially slidable relationship thereto.

4,705,146

DISC BRAKE

James H. Tarter, Troy, Mich., assignor to Allied Corporation, Morristown, N.J.

Filed Apr. 2, 1984, Ser. No. 596,176

Int. Cl.[4] F16F *69/04*

U.S. Cl. 188—73.1 **5 Claims**

1. In a disc brake having a caliper member for urging first and second pads into engagement with a rotor to effect a brake application, said rotor having a pattern of nodes corresponding to a natural frequency associated with an oscillation condition, characterized by said first and second pads defining first and second operational areas, respectively, that are offset each other and engage opposite surfaces on said rotor, said first and second operational areas having an arcuate length which is less than an arcuate length between nodes corresponding to a frequency mode of said rotor which could create undesirable noise during a brake application, said offset preventing said first and second operational area from totally operating in the same nodal diameter to further reduce the development of noise, said arcuate length being more than five but less than ten nodal diameters of said rotor.

4,705,147

BRAKE ACTUATOR WITH AUTOMATIC ADJUSTMENT

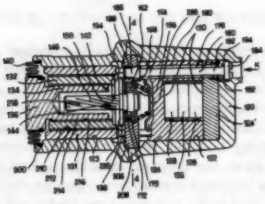
Pierre Pressaco, La Courneuve, and Jean-Paul Sauvée, Aubervilliers, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Continuation of Ser. No. 661,517, Oct. 15, 1984, abandoned. This application Mar. 23, 1987, Ser. No. 30,286

Claims priority, application France, Oct. 28, 1983, 83 17300

Int. Cl.[4] B60T *13/02*

U.S. Cl. 188—196 D **16 Claims**



1. A brake actuator with an automatic slack adjuster incorporating a screw and nut actuator mechanism whose elongation is controlled by the combination of a control device having a screw and nut with reversible pitch and a unidirectional clutch sensitive to relative axial displacement between a control piston and a fixed body housing said control piston, characterized in that said unidirectional clutch effects rotational operation of said automatic slack adjuster and incorporates an automatic device for momentarily disengaging the automatic slack adjuster when rotational torque of said screw and nut actuator mechanism exceeds a predetermiend value, said automatic device for disengaging the automatic slack adjuster including two surfaces facing each other and normally pushed against one another in frictional engagement, one of the surfaces being fixed firmly to the body and the other surface being fixed firmly to said unidirectional clutch, at least one spring pushing said two surfaces into engagement against one another to effect the frictional engagement which defines said predetermined value beyond which the two surfaces are capable of rotational movement relative to one another, said spring being a first compression spring pushing a component of the unidirectional clutch, the component carrying said other surface, and the combination including a control ring having on an internal diameter at least one projection entering into a helical groove formed peripherally on the nut of the screw and nut actuator mechanism to provide the control device having a screw and nut with reversible pitch.

4,705,148

CLUTCH BRAKE ASSEMBLY

Hugh A. Zindler, Long Beach, Calif., assignor to Valley Industries, Inc., Seattle, Wash.

Filed Dec. 18, 1984, Ser. No. 683,915

Int. Cl.[4] F16D *51/62*

U.S. Cl. 192—8 R **12 Claims**

1. A cover actuated clutch brake assembly for awning apparatus comprising

a shaft;

a clutch drum coupled to a roller member rotatably supported on said shaft for rolling an awning thereon and unrolling the awning therefrom;

a cover rotatably supported on said shaft substantially coaxial with and adjacent said clutch drum;

clutch means within said clutch drum restraining relative rotation therebetween when said clutch means is forced against said clutch drum;

guide means coupled to said cover for guiding said clutch means in radial motion with respect thereto and preventing substantial rotation of said clutch means with respect thereto;

first cam means coupled to said shaft and cooperatively disposed with respect to said clutch means to force said clutch means radially outward against said clutch drum upon rotation of said clutch means with respect to said shaft in either of first and second directions relative to a neutral position; and

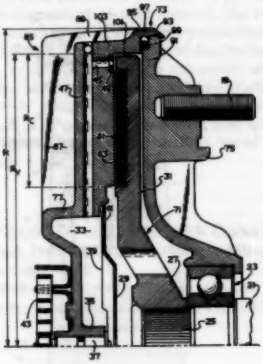
over center means coupled between said cover and said shaft for encouraging said cover in either of said first and second directions relative to a neutral position corresponding to said neutral position of said clutch means.

4,705,149

FLUID COUPLING DEVICE HAVING INCREASED TORQUE-TRANSMITTING CAPABILITY

Stephen M. Clancey, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 6, 1985, Ser. No. 731,179
Int. Cl.[4] F16D *35/00, 43/25*
U.S. Cl. 192—58 B 13 Claims



1. A relatively high-torque fluid coupling device of the type including a first rotatable coupling assembly comprising a housing member and a cover member cooperating to defined a fluid chamber therebetween, and means for joining said housing member and said cover member, means associated with said first rotatable coupling assembly and disposed to separate the fluid chamber into a fluid operating chamber and a fluid reservoir chamber, a second rotatable coupling member disposed in said fluid operating chamber and being rotatable relative to said first rotatable coupling assembly, the forward surface of said second rotatable coupling member and an adjacent surface of said cover member cooperating to define a viscous shear space therebetween, comprising said forward surface of said rotatable coupling member and said adjacent surface of said cover member cooperating to defined a plurality of interdigitated lands and grooves, said cover member including a plurality of cooling fins disposed on the forward surface of said cover member, said cooling fins being operable to dissipate heat transmitted from said viscous shear space by said cover member, said first rotatable coupling assembly defining a maximum, predetermined radius R of said fluid coupling device, said cooling fins disposed on said forward surface of said cover member extending around the outer periphery of said cover member and defining a radius of approximately R, characterized by:

(a) said means for joining said cover member and said housing member comprises said housing member and said cover member defining generally cylindrical surfaces in facing engagement, said surfaces being disposed rearwardly of said shear space; and

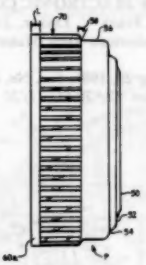
(b) said cover member defining a first annular inner surface comprising the outer periphery of said fluid chamber, and said second rotatable coupling member including a first annular outer surface closely spaced apart from said first annular inner surface of said cover member, said first annular outer surface having a radius at least in the range of about 0.87R to about 93R. to increase substantially the radius of said viscous shear space and the radius of efficient cooling fins, in relationship to radius R of said fluid coupling device.

4,705,150

METHOD AND MACHINE FOR SPLINING CLUTCH HUBS WITH CLOSE TOLERANCE SPLINE BELLMOUTH AND OIL SEAL SURFACE ROUNDNESS

Gary R. Hill, 25809 Mary St., Mt. Clemens, Mich. 48085

Division of Ser. No. 500,754, Jun. 3, 1983. This application Jul. 1, 1985, Ser. No. 749,965
Int. Cl.[4] F16D *13/60*
U.S. Cl. 192—70.2 13 Claims



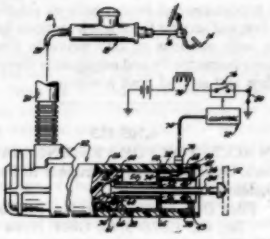
1. A power transmission member comprising a radially-extending end wall and a cylindrical axially-extending sleeve connected to the end wall and terminating remote from the end wall in an open end, said sleeve having pressure formed internal and external axially-extending splines formed therein by intermeshing of teeth of a mandrel on which the sleeve is mounted and teeth of a pair of racks slidable therepast, said splines terminating short of the open sleeve end in an unsplined cylindrical ring-shaped lip portion which reduces bellmouth of the splines to within about 0.010 inch along their length.

4,705,151

HYDRAULIC SLAVE CYLINDER INTERLOCK SWITCHING DEVICE WITH PROXIMITY SENSOR

Keith V. Leigh-Monstevens, Troy; Richard A. Nix, Rochester Hills, and Claude A. Patalidis, deceased, late of Southfield, all of Mich. (by Monique Patalidis, executrix), assignors to Automotive Product plc, Warwickshire, England

Filed Oct. 31, 1985, Ser. No. 793,710
Int. Cl.[4] F16D *13/75*
U.S. Cl. 192—111 A 10 Claims



1. In a hydraulic apparatus for remotely actuating a motor vehicle mechanical clutch, said apparatus comprising a master cylinder having an input member operable by a clutch control pedal, a slave cylinder having a piston associated with an output member operating a release mechanism for the clutch to disengage the clutch, and a conduit connecting said master cylinder to said slave cylinder, the improvement comprising a proximity sensor mounted on said slave cylinder in proximity to the path of movement of said output member and operative to provide an output signal representing a position of said output member corresponding to disengagement of the clutch,

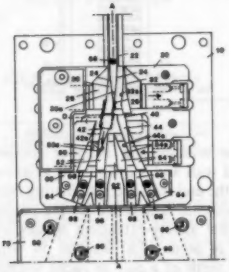
means deriving from said sensor output signal an appropriate control signal corresponding to disengagement of the clutch, an electrical starter motor circuit for the engine of the motor vehicle and including interlock switching means, and control means operable by said control signal for operating said interlock switching means to enable said starter motor circuit.

4,705,152

SWITCH TRACK ASSEMBLY FOR HIGH-SPEED HANDLING OF ELECTRONIC COMPONENTS

Frank V. Linker, and Frank V. Linker, Jr., both of Broomall, Pa., assignors to American Tech Manufacturing, Inc., Glenolden, Pa.

Filed May 22, 1986, Ser. No. 866,222
Int. Cl.[4] B65G *11/20*
U.S. Cl. 193—39 **6 Claims**



1. A switch track mechanism for selectively directing electronic components from a single trackway to one of a plurality of discharge or accumulator stations comprising a first fixed track section adjacent the trackway, a second fixed track section downstream of said first fixed track section, movable first and second track members operatively associated with said first and second fixed track sections and each operable between first and second limit positions, said second movable track member having a plurality of track sectors disposed in an array, a plurality of accumulator stations downstream of said second track member corresponding in number to the number of track sectors, and means for actuating the movable track sections between limit positions whereby electronic components may be directed from the single trackway to a select one of the accumulator stations by actuation of said movable track sections to predetermined limit positions relative to one another, said first and second fixed track sections having portions confronting with portions of said movable first and second track members respectively and engageable therewith to determine said first and second limit positions.

4,705,153

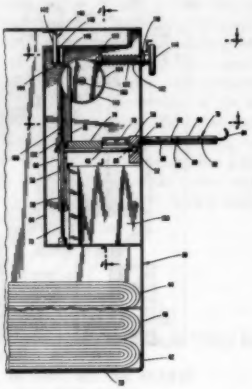
COIN ACCEPTOR FOR VENDING MACHINE

Frank J. Koch, Ogdensburg, N.Y., assignor to DeFelsko Corporation, Ogdensburg, N.Y.

Filed Dec. 23, 1985, Ser. No. 812,506
Int. Cl.[4] G07D *5/04*; G07F *11/04*
U.S. Cl. 194—277 **28 Claims**

1. A device for testing an object, comprising:
first and second members spaced apart from one another in an initial configuration;
a third member having the object selectively positioned thereon, said third member being carried by said first and second members with said third member being frictionally engaged by an upper surface of said first and second members;
means for moving said first and second members toward one another whereby the third member is displaced a distance corresponding to the relative friction between the third member and each of the first and second members, said relative friction corresponding to the weight of the object; and
means for comparing the distance which said third member is displaced with a reference position.

19. A method for testing an object, comprising:
spacing first and second members apart from one another in an initial configuration;
carrying a third member by said first and second members in said initial configuration with said third member being



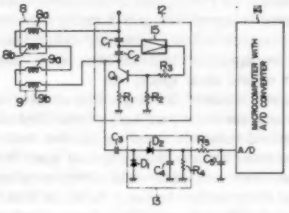
frictionally engaged by an upper surface of said first and second members;
selectively positioning the object on the third member;
moving said first and second members toward one another whereby the third member is displaced a distance corresponding to the relative friction between the third member and each of the first and second members, said relative friction corresponding to the weight of the object; and
comparing the distance which said third member is displaced with a reference position.

4,705,154

COIN SELECTION APPARATUS

Yukio Masho, Hashima; Shigeru Kakimi, Inazawa; Toru Ueki; Satoshi Miyauchi, both of Gifu; Tugio Ohigashi, Aichi, and Hitoshi Kurohata, Komaki, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Sep. 23, 1985, Ser. No. 779,122
Claims priority, application Japan, May 17, 1985, 60-105003; May 17, 1985, 60-105004; May 17, 1985, 60-105005
Int. Cl.[4] G07F *3/02*
U.S. Cl. 194—319 **7 Claims**



1. A coin selection apparatus comprising:
a coin path along which a coin is fed;

at least two coin sensors arranged along said path and having impedances which are changeable with the passage of a coin therealong;

a detection circuit means for detecting impedance changes of said coin sensors; and

a discrimination circuit means, connected to said detection circuit means, for discriminating coin characteristics on the basis of the detected impedances of said coin sensors; and wherein

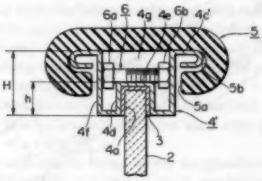
each of said two coin sensors comprises two coils opposingly arranged to said coin path, one of said two coin sensors has its two coils connected in series in phase principally for the discrimination of coin material, the other of said two coin sensors has its two coils connected in series in phase opposition principally for the discrimination of coin thickness, said coin sensors are connected in series, and said one and said other coin sensors have a defined spacing therebetween along said coin path principally for the discrimination of coin diameter, with said spacing being smaller than a diameter of the smallest one of the coins to be selected.

4,705,155

BALUSTRADE OF A PASSENGER CONVEYOR

Osamu Kanamori, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 27, 1984, Ser. No. 686,680
Claims priority, application Japan, Dec. 29, 1983, 58-201566
Int. Cl.[4] B66B *23/24*
U.S. Cl. 198—335 **9 Claims**



1. A balustrade for a passenger conveyor comprising:

a balustrade panel longitudinally disposed in a vertical plane along a main frame of the passenger conveyor;

a handrail guide attached on an edge of said balustrade panel for slidably supporting and guiding a moving handrail for movement along the panel edge, said handrail guide including:

a channel member having a substantially U-shaped cross section having a pair of spaced side wall members disposed in substantially vertical planes and having a predetermined distance therebetween and straddling said balustrade panel, said channel member having a bottom wall member between said side wall members;

extension wall members disposed on both sides of, and formed integrally with, said channel member and having outer walls spaced laterally from, and connected to, both side wall members of said channel member and extending vertically above said bottom wall member whereby said extension wall members, as formed with said channel member, have a given spacing therebetween;

a guide rail disposed on said extension wall members for guiding the handrail; and

separating means disposed in the space between, and transverse to, said extension wall members and extendable in the transverse direction to engage and further space, when extended, said extension wall members from each other, thus causing the side wall members of said channel member to contract and grip said balustrade panel straddled therebetween,

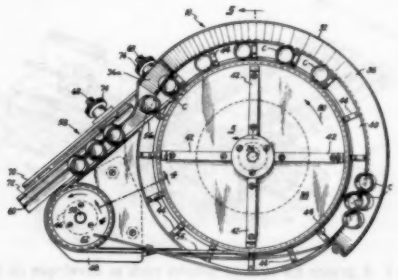
said handrail guide having a rigidity allowing said channel member to contract to decrease said distance between said side wall members when said extension wall members are further spaced by said separating means, thereby firmly gripping said balustrade panel by said side wall members.

4,705,156

BELT FEEDER FOR ORIENTING AND TRANSPORTING ROUND SYMMETRICAL PARTS

Monte J. Boling, Fairfield, N.J., assignor to Anderson Machine Works, Ridgefield Park, N.J.

Filed Nov. 15, 1985, Ser. No. 798,573
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—392 **12 Claims**



1. A parts orienting and transporting system comprising:

a generally planar rotatable disc means supported for rotation in an inclined plane from horizontal so as to always present an upper disc portion that is elevated with respect to the remainder of the disc, the disc including first and second stepped circumferential portions of different diameters, the first circumferential portion having a smaller diameter than the second circumferential portion and being disposed above the latter;

a rotary drive means;

and endless drive belt means extending from the rotary drive means and around the first circumferential portion of the disc means in driving relationship, a driving tensioned side of the belt defining a transport portion extending substantially horizontally between the drive means and the first circumferentially portion of the disc means, said transport portion diverging tangentially away from said first circumferential portion;

a stationary parts retaining wall extending generally perpendicularly above the plane of the disc means and along the second circumferential portion thereof, said wall including a slanted portion closest the disc means inclined upwardly and away from the second circumferential portion of the disc means, said wall terminating adjacent the tangentially diverging transport portion of the drive belt means so as to define a part tilting area of the wall whereat the diverging transport portion of the drive belt means and the adjacent slanted portion of the wall converge towards each other to cause upward tilting of parts carried by the second circumferential portion of the disc and transported by the disc between the part tilting area of the wall and the transport portion of the belt drive means;

a balance rail means disposed along and adjacent said transport portion of the drive belt means in spaced parallel relationship and arranged to form a continuous extension of the tilting portion of said wall, said rail means comprising a part support surface extending to one side of and above said transport portion of the drive belt means, said part support surface and said transport portion of said drive belt means defining a part support and transport system for receiving parts disposed on the second peripheral portion of the disc means and carried thereby to the

transport portion of the drive belt means whereat said parts are tilted upright by the part tilting area of said wall, and for transporting said upright oriented parts in a balanced condition away from the disc means during operation of the system.

4,705,157

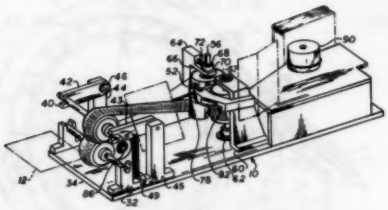
ARTICLE TURNING ASSEMBLY

Myron A. Bowles, Waukegan, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jun. 9, 1986, Ser. No. 872,296

Int. Cl.[4] B65G *15/00*

U.S. Cl. 198—405 **20 Claims**



1. A device for turning articles such as envelopes or documents through 90 degrees about a conveying axis as the articles are moved forward from an entrance location to an exit location comprising:

two flexible endless belts each having at least one span contiguous to a corresponding span of the other, the contiguous spans moving in the same direction;

a pair of entrance rollers having contoured surfaces and mounted with respect to each other such that a line of tangency between the pair of entrance rollers forms an angle with respect to the plane of the articles as they enter the entrance location and causing the articles to begin turning in the direction of the line of tangency as they enter between the rollers;

a pair of exit rollers, with one of the flexible endless belts wrapped around one of the entrance and exit rollers and the other flexible endless belt wrapped around the other entrance and exit rollers, the belts adapted to convey and turn the article 90 degrees in the direction of movement from the entrance location to the exit location, the entrance and exit rollers having centrally disposed axes, the axes of the entrance rollers disposed horizontally and the axes of the exit rollers turned an angle of 90 degrees in the direction of the angular displacement of the article such that the axes of the exit rollers are vertically disposed;

means for guiding and maintaining the flexible endless belts wrapped around the entrance and exit rollers; and

means for driving at least one of the rollers to move the contiguous belt spans together in the same direction from the entrance location to the exit location at the same rate of speed.

4,705,158

CUP FEED APPARATUS

Ean Sirvet, Washington Township, Bergen County, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Dec. 31, 1986, Ser. No. 948,273

Int. Cl.[4] B65G *37/00*

U.S. Cl. 198—463.4 **6 Claims**

1. Apparatus for controlling movement of one-piece cylindrical-configuration sheet metal cups along a fabricating line into a press redraw station, comprising

a supply of sheet metal cups, each having a side wall symmetrically disposed in relation to its centerline axis and a unitary closed end wall, with such side wall defining an open end longitudinally opposite to such unitary closed end wall,

a conveyor means for transporting such cups,

collimating means defining a single file travel path for such cups as transported by such conveyor means, such collimating means presenting a collimating rail with a cup side wall contact surface on each lateral side of such travel path,

such cups being transported with their central longitudinal axes substantially parallel to each other while traveling in a forward direction toward such redraw station,

such cups being of uniform side wall configuration with a rigidity enabling lateral and longitudinal movement of such cups in relation to such tavel path by acting on such cup side walls,

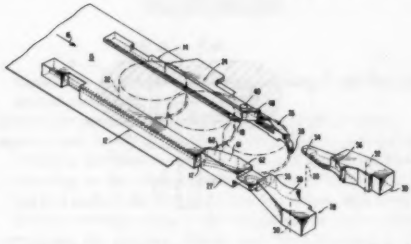
cup registry means, located downstream of terminating ends of such collimating rail surfaces, for receiving and positioning a cup for redraw,

such cup registry means including

a pair of elongated registry arms each being longitudinally oriented to extend generally along such longitudinal direction of cup movement,

such pair of arms being symmetrically disposed in relation to the centerline of the travel path defined therebetween for movement of cups into such redraw station, such travel path centerline passing through the central axis of such redraw station,

each such registry arm having an internal surface positioned in relation to the central axis of such redraw station to



define, at least in part, a cylindrical surface for receiving and holding a cup in registry with such press redraw station,

such cylindrical configuration surfaces of the registry arms conforming in configuration to that of a cup side wall in a plane perpendicularly transverse to its axis prior to redraw and being in concentric relationship with the centerline axis of such redraw station,

such elongated registry arms being longitudinally stationary in relation to the direction of movement of cups along such cup travel path with each arm being pivotally mounted at a location longitudinally beyond the central axis of such redraw station in the direction of cup travel to permit angular movement of remaining entry portions of such arms to open and close in a direction transverse to the longitudinal direction of movement of cups in approaching such redraw station,

such elongated registry arms being spring loaded to bias such remaining entry portions of the arms in closed relationship so as to require opening for purposes of receiving a cup for longitudinal movement along entry surfaces of such arms leading to such portions defining a cylindrical configuration between such arms;

gate means for interrupting longitudinal movement of an individual cup along such cup travel path toward such redraw station,

such gate means being located solely on one lateral side of such cup travel path and being longitudinally stationary while being pivotally mounted to permit angular move-

ment of each longitudinal end of such gate means including movement of its longitudinal end disposed toward such registry arms in a direction transverse to and into such cup travel path so as to block longitudinal cup movement toward such redraw station,

such gate means being spring biased to hold its longitudinal end disposed toward such elongated registry arms in an open position in relation to such cup travel path,

such gate means including a cam follower surface disposed in lateral side wall relationship to such cup travel path in a position to control pivotal movement of such gate means to move such longitudinal end disposed toward such registry arms to its closed position, blocking longitudinally forward movement of a cup along such travel path to such redraw station,

ramp means located only on the remaining lateral side of longitudinal cup movement opposite to such gating means,

such ramp means presenting a lateral side wall ramp surface, confronting such travel path, such ramp surface projecting transversely from the lateral side wall plane of the collimating rail surface on such remaining side so as to decrease the transverse dimensional opening at the cup exit end of such collimating rail surface to enable holding a cup longitudinally stationary contiguous to the head of collimated cup between such collimating rail surfaces,

pusher arm means located only on the same lateral side of such travel path as such gate means for movement between positions contiguous to such collimating means and such press redraw station,

such pusher arm means including

a pusher-arm rail presenting a lateral side surface which is coplanar with the lateral surface of such collimating rail located on such same side of the cup travel path as such gate means,

a cup pushing surface at the leading end of such pusher-arm rail, and

a cam located contiguous to the longitudinal end of such pusher arm rail which includes such cup pushing surface,

such pusher-arm means being solely longitudinally movable in relation to the cup travel path established by such collimating means and having a retracted position in which such pusher arm rail surface is substantially coextensive longitudinally with a portion of such collimating rail surface and coplanar with its lateral surface when such pusher-arm means is contiguous to the discharge end of such collimating means,

such pusher-arm means having an extended forward position in which such cup pushing surface moves a cup from such gate means into registry in such redraw station,

such pusher-arm rail, when in its retracted position, permitting longitudinally forward movement of such cup being held contiguous to the discharge end of such collimating means and transverse movement of such cup along such ramp surface into coaction with such gate means which temporarily interrupts further forward longitudinal movement of such cup while such pusher-arm cam is in contact with such cam follower surface of the gate means to hold such longitudinal end of such gate means disposed toward such registry means in a closed position to block passage of such cup in the forward direction of the cup travel path toward such redraw station,

such cup when being held by such gate means holding the next sequential cup contiguous to such discharge end of such collimating means to prevent forward movement thereof,

such pusher-arm means in moving from its retracted position opening such gate means and move such cup into registry between such elongated registry arms,

with such next sequential cup in such collimating means, upon release of such cup held by the gate means, moving in the forward direction of cup travel to be held between such pusher arm rail surface and the ramp means on the opposite lateral side of such cup travel path line.

4,705,159

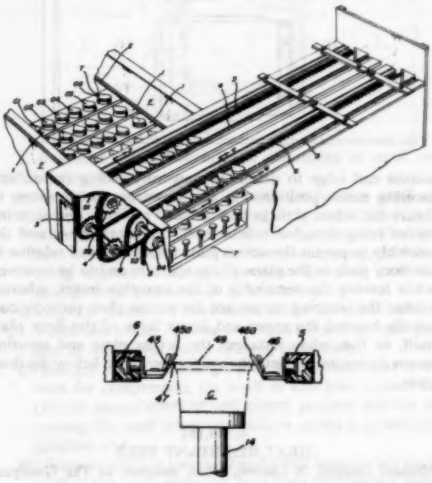
CONVEYING SYSTEM FOR REMOVING CONTAINERS FROM A PACKAGING MACHINE

James J. Feliks, Doraville; Will L. Culpepper, Covington, and Dale K. Scott, Jonesboro, all of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Jun. 2, 1986, Ser. No. 869,249

Int. Cl.[4] B65G *25/00*

U.S. Cl. 198—468.8 **11 Claims**



1. A conveying system for removing filled and sealed flanged containers from a container filling and sealing machine, said system comprising a pair of conveyor chains having horizontally spaced longitudinally movable working reaches mounted so as to prevent sidewise movement away from each other, a plurality of upwardly projecting bendable clips formed of plastic material secured at lower ends thereof to each of said chains and having container engaging edges disposed between said chains, movable means for moving a filled and sealed container between said chains and to cause the flange on the container to move into engagement with the container engaging edge of at least one clip on each of said chains, and means for moving said movable means out of contact with the container to transfer support of the container to said clips.

4,705,160

SCRAPER-CHAIN CONVEYORS FOR MINERAL MINING

Dieter Gründken; Manfred Redder, both of Lünen, and Hartmut Schewinski, Kamen-Westick, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Continuation of Ser. No. 694,018, Jan. 23, 1985, abandoned. This application Nov. 6, 1986, Ser. No. 928,667

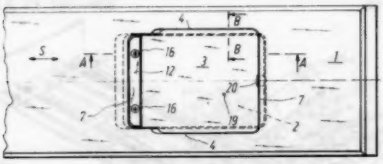
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1984, 3404898

Int. Cl.[4] B65G *19/28*

U.S. Cl. 198—735 **14 Claims**

1. In or for a scraper-chain conveyor; a floor plate assembly comprising a continuous floor plate, an aperture in the floor plate bordered by confronting first and second end edges and confronting first and second side edges, said first and second

end edges having downwardly facing recesses and said first and second side edges providing support surfaces, a removeable access plate fitted directly in the aperture of the floor plate and resting on said support surfaces thereby to close said aperture, the aperture and the access plate being dimensioned to permit the access plate to be received in the aperture and to be displaced in the plane of the aperture and relative to the floor plate into an installed position at which one portion of the access plate underlies said first end edge and is received in the downwardly facing recess thereof and another portion of the access plate underlies said second end edge and is received in the downwardly facing recess thereof and cooperates with said



second end edge to define an upwardly facing recess, and securing means positioned in said upwardly facing recess to secure the access plate in said installed position, said securing means being detachable from both the access plate and the assembly to permit the access plate to be displaced relative to the floor plate in the plane of the aperture and to be removed while leaving the remainder of the assembly intact; wherein neither the securing means nor the access plate projects outwardly beyond the upper and lower faces of the floor plate itself, so that when installed, the access plate and securing means do not intrude into the spaces above and below the floor plate.

4,705,161

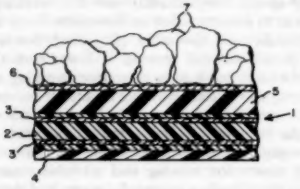
HEAT RESISTANT BELT

Michael Gozdiff, N Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 21, 1986, Ser. No. 898,916

Int. Cl.[4] B65G *15/34*

U.S. Cl. 198—847 **11 Claims**



1. An insulating conveying belt composed of a belt carcass having at least one embedded reinforcing ply, a pulley cover and a top cover, said top cover having a heat resistant member adhered to said top cover, said heat resistant member being selected from the class consisting of fibers of aramid, glass, ceramic or mixtures thereof.

4,705,162

MULTIPLE DISPLAY CARTON SHIPPING PACKAGE

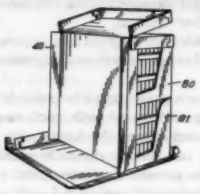
Julius B. Kupersmit, 299 W. 12th St., New York, N.Y. 10011

Filed Nov. 13, 1986, Ser. No. 929,800

Int. Cl.[4] B65D *1/22*

U.S. Cl. 206—45.11 **5 Claims**

1. An improved display carton shipping package comprising: a plurality of generally rectangular package trays, each having plural rectangular packages of items of merchandise in juxtaposed relation thereon; a plurality of prime modules, said package trays and rectangular packages thereon being positioned in juxtaposed relation within said prime modules, each of said prime modules including a bottom wall, a single vertical end wall, a pair of partial side walls, and a partial top wall; a single T-box section formed of first and second symmetrically arranged elements, each element including a vertical wall having upper and lower edges, and a pair of horizontal flaps forming top walls, each hingedly connected at said vertical wall at an upper edge, and having a peripheral rim at the free edges thereof; a single tray base element having a bottom wall and a selectively interconnectable peripheral rim; said package being assembled by loading plural package trays with items of rectangularly packaged merchandise, placing said loaded trays



in adjacent and stacked relation to fill a plurality of prime modules; placing a first plurality of loaded modules upon said base element adjacent one end thereof, positioning said T-box section such that said lower edge of said vertical wall thereof contacts a medial transversely extending area of the upper surface of said bottom wall of said base element, positioning a second plurality of loaded modules upon said base element on an opposite side of said vertical wall of said T-box section, positioning said horizontal flaps of said T-box section upon the uppermost surfaces of said modules wherein said peripheral rim thereof engages the upper exposed portions of each of said modules, and interconnecting said peripheral rim of said base element to engage the exposed lower portions of said modules to form an integral package.

4,705,163

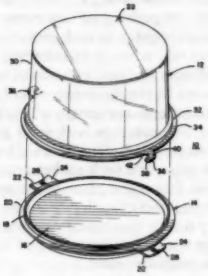
CAKE HOLDER

Tracye V. James, P.O. Box 8031, Temple Hills, Md. 20748

Filed Feb. 3, 1987, Ser. No. 10,478

Int. Cl.[4] B65D *85/36, 25/00*

U.S. Cl. 206—45.32 **20 Claims**



1. A cake holder comprising a cover and a base, said base having: a circular central cake support surface supporting a cake, a circumferential upwardly projecting rim disposed around said cake support surface, said base having a generally circular outer periphery with at least two handles projecting radially outwardly from said outer periphery, each handle having a slot therein; and said cover having: a top, an annular side wall extending downwardly from the top, a circumferen-

tial mating portion at the bottom of said side wall adapted for mating with said rim, said cover having a generally circular outer periphery with at least two flanges projecting radially outwardly from said the outer periphery of the cover, each flange having an end portion extending out from a support portion in a circumferential direction to define an open space between the outer periphery of the cover and the end portion, each end portion removably securable to fit into a corresponding one of said slots.

4,705,164

PACKAGE FOR MATCHES

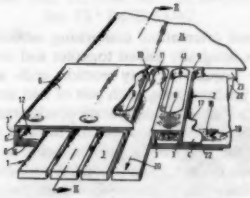
Eric W. M. V. Parein, Faiderstraat 79, Elsene, Belgium (B-1050)

Division of Ser. No. 456,057, Jan. 5, 1983, Pat. No. 4,525,981. This application Mar. 27, 1985, Ser. No. 716,700

Claims priority, application Belgium, May 15, 1981, 0/204 805; PCT Int'l Appl., May 14, 1982, PCT/BE82/00010

Int. Cl.[4] A24F *27/20, 27/26*

U.S. Cl. 206—98 **11 Claims**



1. A match package comprising the combination of:

a core presenting opposite side walls having generally parallel end edges, said core including a plurality of generally parallel, spaced partition walls connecting the opposite side walls and extending from one end edge to the opposite end edge of the side walls, one of the side walls having long oblong openings extending from adjacent one end edge thereof through the opposite end edge thereof between every other pair of adjacent partition walls and short oblong openings extending from adjacent the one end edge toward but terminating short of the opposite end edge between the remaining adjacent pairs of partition walls, the other side wall likewise having long oblong openings extending from adjacent the one end edge thereof through the opposite end edge thereof between every other pair of adjacent partition walls and short oblong openings extending from adjacent the one end edge toward but terminating short of the opposite end edge between the remaining adjacent pairs of partition walls, the long and short openings of the respective side walls being opposed to each other and in overlapping relation;

closure means secured to the opposite side walls of the core in covering relation to said openings for defining a series of match-receiving compartments within the core which are of uniform height within the overlapping regions of the openings, of reduced height in regions at the open ends of the compartments between opposed areas of the side walls, closed at said one end edge and open at the opposite end edge;

a plurality of matches each having a head end received in a respective compartment adjacent the closed end thereof and a free end projecting from the open end of its compartment, the head end of each match being of a thickness substantially the same as said substantially uniform height; and

striking means in each compartment within the region thereof of reduced height for frictionally engaging a match head automatically to strike same in response to axial withdrawal of the match from the compartment.

4,705,165

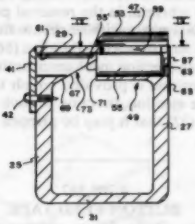
SNUFF HOLDER AND DISPENSER

Michael D. Thieke, 6163 Lacewood Cv., Memphis, Tenn. 38115

Filed Sep. 30, 1985, Ser. No. 781,740

Int. Cl.[4] B65D *85/10*

U.S. Cl. 206—253 **5 Claims**



1. A holder for the storing and dispensing of snuff, said holder comprising:

(a) body means having an interior for storing snuff and having an outlet opening leading from said interior to the outside of said body means, said body means including a bore communicated with said outlet opening, said bore being interrupted along a portion thereof to provide a passage from said interior to said bore;

(b) closure means for movement into a closed position in which said outlet opening is obstructed and an open position in which said outlet opening is opened;

(c) plunger means including a plug slidably mounted in said bore for compressing the snuff in said bore against said closure means when in said closed position and for dispensing the snuff when said closure means is in said open position; and

(d) sharp slicing bias means adjacent said bore for slicing the snuff as the snuff enters said bore from said interior during the movement of said plunger to compress the snuff, whereby a plug of snuff is formed.

4,705,166

CONTAINER FOR A GRAMOPHONE RECORD OR VIDEO DISC

Peter Ackeret, Küsnacht, Switzerland, assignor to Ind Inventions and Development of Novelties AG, Chur, Switzerland

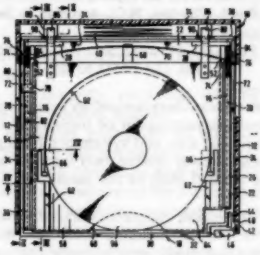
PCT No. PCT/EP85/00706, § 371 Date Aug. 15, 1986, § 102(e) Date Aug. 15, 1986, PCT Pub. No. WO86/03878, PCT Pub. Date Jul. 3, 1986

PCT Filed Dec. 14, 1985, Ser. No. 905,588

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1985, 8436935

Int. Cl.[4] B65D *85/57*

U.S. Cl. 206—309 **24 Claims**



1. Container for a gramophone record or video disc (56)

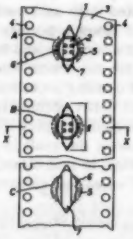
having a housing (10) in which at least one holder (18) accommodating in each case one disc (56) is slideably guided between an inner storage position and an outer removal position into which the holder (18) is biassed by a spring assembly (40), and having a locking arrangement (42, 48) which holds the holder (18) in its storage position in the housing (10) against the spring bias and is manually releasable, wherein each holder (18) has a front wall (32) which covers the housing opening in the storage position, and wherein, in the removal position, front wall (32) is pivoted transversely with respect to the alignment of the disc (56) to such an extent that the disc (56) is removable in alignment, while an ejection mechanism acting on the disc (56) in the removal position is provided which transports the disc (56) further in the ejection direction to such an extent relative to the front wall (32) that it may be gripped pincer-fashion by its main surfaces.

4,705,167

BUTTON FEED TAPE

Masaya Nakamura, Chofu, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1986, Ser. No. 878,124
Claims priority, application Japan, Jun. 29, 1985, 60-143581
Int. Cl.[4] A44B *7/00, 1/00*
U.S. Cl. 206—348 **3 Claims**



1. A button feed tape for feeding buttons to a sewing machine, comprising:

(a) an upper sheet providing a plurality of evenly spaced longitudinal slits therein,

(b) a lower sheet providing a plurality of evenly spaced longitudinal oblong holes therein; and

(c) a plurality of buttons, each of said buttons having at least one button hole therein; wherein

said upper and lower sheets are attached together with the evenly spaced longitudinal slits of said upper sheets and said evenly spaced longitudinal oblong holes aligned together and enclosing the buttons between said upper and lower sheets thereby keeping the button holes aligned in one direction.

4,705,168

DRAWER DIVIDER SYSTEM

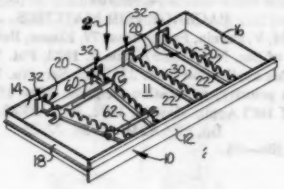
William W. Ward, Clayton, N.C., assignor to Southern Case, Inc., Raleigh, N.C.

Filed Jul. 21, 1982, Ser. No. 400,386
Int. Cl.[4] B65D *85/20*
U.S. Cl. 206—373 **6 Claims**

1. A drawer system characterized by being capable of subdivision into multiple rectangular or trapezoidal compartments of chosen shape and size, said system comprising:

a rectangular drawer having two opposed sidewalls that form the parallel sides of the mentioned compartments; and

a plurality of integral, one-piece, removable drawer dividers formed of plastics material, each said drawer divider including a main body portion comprising a relatively thin elongate strip member having a length approximating the distance between the opposed sidewalls of a drawer, said body portion strip member being substantially vertically upstanding in the operational orientation of said drawer divider and including a plurality of upwardly facing recesses along the length thereof such that the recesses of adjacently positioned dividers may support articles therein, and each divider further including sidewall engaging portions integrally formed at both ends of said body portion, each sidewall engaging portion comprising a pair of resilient arms flaring outwardly from said body portion and terminating in sidewall-engaging tips formed with enlarged cross sectional configuration, said arms, in



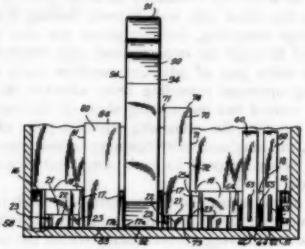
operational orientation, comprising substantially vertical members integrally joined together and integrally joined to their respective body portion ends at substantially vertical juncture lines, each pair of said arms collectively forming a V-shaped configuration, said arms being formed with sufficient resiliency and the integral juncture of the arms to the main body portion being so formed as to permit the divider, when inserted between the opposed drawer sidewalls, to resiliently engage the sidewalls at any selected positions therealong and at chosen angular orientation, thereby providing multiple rectangular or trapezoidal compartments of chosen shape and size.

4,705,169

MULTIPLE CASSETTE STORAGE TRAY

Patrick Mastronardo, Stamford, Conn., assignor to Lebo Peerless, Inc., Bloomfield, N.J.

Filed Oct. 14, 1986, Ser. No. 918,012
Int. Cl.[4] B65D *85/672*
U.S. Cl. 206—387 **8 Claims**



1. A storage tray for unboxed audio cassettes, boxed audio cassettes, 8-track cartridges and 8 mm video boxed cassettes, comprising; a bottom wall, said bottom wall being free of upwardly projecting members so that 8 mm video boxed cassette, 8-track cartridge or unboxed cassettes rest flat on the bottom wall, opposing side walls connected by the bottom wall, front and back walls connected by the bottom wall and side walls, a plurality of dividers extending inwardly from the side walls so as to form a plurality of parallel compartments, each compartment having opposed ledge walls extending inwardly from the opposed side walls and forming upwardly disposed facing walls, said facing walls being formed with spaced parallel vertically extending grooves, and a rib formed

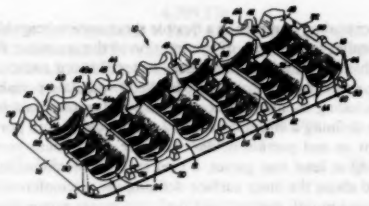
at the corner of one divider and the adjacent side wall, wherein the dividers and ledge facing walls are spaced so that one 8-track cartridge or an 8 mm video boxed cassette is receivable in the compartment between opposing dividers and facing walls with the cartridge or 8 mm video boxed cassette disposed on the bottom wall, wherein said ledge facing walls are flexible so as to grippingly engage the unboxed cassettes, and wherein the rib is spaced from the opposed divider so that a boxed audio cassette is received in the compartment between the rib and opposed divider with the boxed audio cassette disposed on the ledges above the bottom wall, and wherein two unboxed cassettes are received in each compartment, with the end ribs of each unboxed cassette being receivable in the grooves and the ends of the unboxed cassettes contactingly engaging the facing walls so as to hold each unboxed cassette upright with the unboxed cassette disposed on the bottom wall.

4,705,170

FLUORESCENT TUBE DUNNAGE

David E. Creaden, Lawrence, Kans., assignor to Lawrence Paper Company, Lawrence, Kans.

Filed Aug. 11, 1986, Ser. No. 895,507
Int. Cl.[4] B65D *85/42*
U.S. Cl. 206—419 **7 Claims**



1. A fluorescent tube support, comprising:

an integral body formed from synthetic resin sheet material having a thickness prior to forming of from about 0.013 to 0.018 inch, said body having a front margin presenting an elongated, laterally extended lowermost surface, concavo-convex walls defining a number of elongated, open-top, parallel, juxtaposed, concave tube-receiving regions and corresponding convex underside wall surfaces, with elongated top walls between juxtaposed upwardly opening regions,

said region-defining walls including a first plurality of axially spaced apart, upwardly opening and diverging tube-engaging arcuate first wall sections each having a radius generally conforming with the circular sidewall of a fluorescent tube, and a second plurality of axially spaced apart, downwardly opening and diverging tube-engaging arcuate second wall sections each having a radius generally conforming with the circular sidewall of a fluorescent tube,

said upwardly opening first wall sections and said downwardly opening second wall sections alternating along the length of each of said regions,

the lateral ends of said downwardly opening wall sections being at the vertically lowest extent of said support when the support is horizontally oriented, there being upright wall sections interconnecting said first and second wall sections,

said first and second tube-engaging wall sections each being formed with undulating tube-engaging surfaces; and

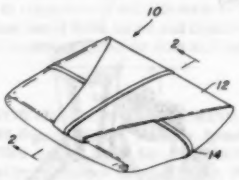
spacer means for preventing complete nesting of plural supports and to define substantially uniform, elongated, laterally extending spaces between adjacent interfitted supports for insertion of automatic dispensing equipment therebetween, said spaces having a vertical height of at least about ¼ inch, said spacer means including structure for creating a vertical space between the top walls of adjacent interfitted supports in a stack thereof to facilitate separation of individual supports from said stack.

4,705,171

WRAPPER FOR DELIVERING STERILE DISPOSABLES

Charles J. Eldridge, Pennsauken, N.J., assignor to Temple University-of the Commonwealth System of Higher Education, Philadelphia, Pa.

Filed Nov. 20, 1986, Ser. No. 932,859
Int. Cl.[4] A61B *19/00*
U.S. Cl. 206—438 **6 Claims**



1. A package for wrapping a sterile article comprises:

a generally rectangular wrapping material having corner portions;

a strap means being generally T-shaped and having three free ends;

each free end of said strap means being affixed adjacent one said corner portion; and

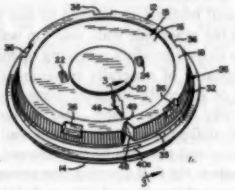
a pull means being affixed to said strap means.

4,705,172

LID WITH ORIENTATION DEVICE

Jeffrey C. Gage, Beaverton, Oreg., assignor to Gage Industries, Inc., Lake Oswego, Oreg.

Filed Jun. 27, 1986, Ser. No. 879,480
Int. Cl.[4] B65D *21/02, 41/16, 43/03*
U.S. Cl. 206—519 **3 Claims**



1. A stackable lid for placement onto a container by automated processing machinery, the container having a flat peripheral ledge-like rim, the lid comprising:

an upper cover portion;

a rim portion continuous with the cover portion including a sidewall portion extending downward from the cover portion, a ledge portion for engaging said container rim, and a skirt portion adapted to extend downwardly around said container rim;

a plurality of inwardly extending stacking projections formed in said sidewall portion;

a plurality of locking projections on said skirt adapted to engaged beneath said container rim; and

an alignment notch formed in said sidewall portion positioned directly above one of the locking projections, the alignment notch providing mechanical alignment means for rotationally aligning individual lids within a stack of such lids, the alignment notch providing visual means for enabling a user easily to detect the rotational orientation of a stack of such lids for a user's proper placement of a

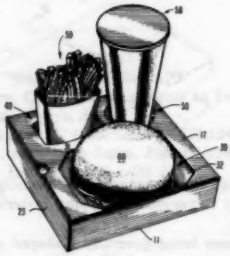
stack of the lids into a lid infeed portion of the automated processing machinery for preventing the processing machinery from becoming jammed due to misaligned lids.

4,705,173

CARRYOUT TRAY WITH DIVERSE APERTURES

Hampton E. Forbes, Jr., Newark, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed Dec. 3, 1986, Ser. No. 937,207
Int. Cl.[4] B65D *1/34*
U.S. Cl. 206—563 1 Claim



1. A carryout tray for three different shaped food products, prepared from a single blank of material and capable of being folded from a collapsed condition prior to use into an erect, useable condition comprising.

(a) a bottom wall of generally rectangular configuration having side edges;

(b) a pair of side walls foldably connected to two opposite edges of said bottom wall;

(c) an auto-lock end closure foldably connected to one of the other opposed edges of said bottom wall and a tuck style end closure foldably connected to the remaining opposed edge of said bottom wall;

(d) a top wall foldably connected to one side wall and adhered to the other side wall, said top wall including three different shaped product receiving openings consisting of a first opening of generally rectangular shape, a second opening of generally elliptical shape and a third opening of generally circular shape , said openings being formed by panels deflectable below the top wall comprising foldably connected portions of the material of said top wall, said panels at the first opening comprising full width flaps of abbreviated length with free ends foldably attached to opposite sides of said first opening, said panels at the second opening comprising a pair of opposed edge flaps of generally equal size and shape foldably attached to opposite sides of said second opening, and said panels at the third opening comprising three integral tab elements which extend slightly inside the third open area foldably attached to and equally spaced around the third opening; and,

(e) a bridge element formed from the material of said top wall located between the free ends of the full width flaps of said first opening and arranged to separate the top wall from the bottom wall, said bridge element comprising two panels, a first panel foldably connected to the top wall along an edge of said first product receiving opening and a second panel foldably attached to the first panel and adhered to the bottom wall, said first bridge panel being pivotable from a collapsed position adjacent to and located in a plane generally parallel with said bottom wall to an erect position generally perpendicular to said top and bottom walls.

4,705,174

SEALED FLEXIBLE CONTAINER WITH NON-DESTRUCTIVE PEELABLE OPENING

Luigi Goglio, Milan, Italy, assignor to Fres-Co System USA, Inc., Telford, Pa.

Continuation of Ser. No. 584,587, Feb. 29, 1984, Pat. No. 4,576,285, which is a continuation-in-part of Ser. No. 496,770, May 20, 1983, Pat. No. 4,518,087. This application Apr. 25, 1986, Ser. No. 830,397
The portion of the term of this patent subsequent to May 21, 2002, has been disclaimed.
Int. Cl.[4] B65D *33/16*
U.S. Cl. 206—632 10 Claims

1. A container comprising a flexible sheet material capable of being sealed for closing off the interior of the container from the ambient atmosphere, said sheet material being resistant to tearing, said container having a peripheral wall, said peripheral wall including an inner surface and an outer surface, said inner surface defining a circumferentially continuous mouth portion adjacent an end portion of the container, said mouth portion including at least one gusset, a peel strip means permanently adhered about the inner surface defining the circumferentially continuous mouth portion, said peel strip means comprising at least two plastic material layers permanently adhered to each other, said peel strip means being disposed so that when said container is sealed contiguous surface portions of the same plastic material layer of said peel strip means are in releasable engagement with each other to form an air-tight interfacial seal therebetween for closing off the interior of the container from the ambient atmosphere, said interfacial seal being readily openable by peeling said engaging contiguous surface portions of said peel means from each other to provide a clean opening providing ready access to the interior of said container without tearing said sheet material.

4,705,175

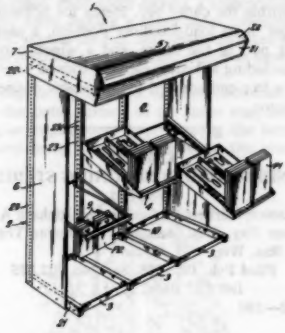
DISPLAY AND PULL-OUT TRAY ASSEMBLIES FOR INTEGRATED MODULAR STORE FIXTURE SYSTEM

Fred Howard, New York, and Sydney Edson, East Meadow, both of N.Y., assignors to Sara Lee Corporation, Winston-Salem, N.C.

Filed Feb. 17, 1987, Ser. No. 15,147
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—59.2 16 Claims

1. In an integrated modular store fixture system having at least two spaced apart parallel vertical members with side surfaces facing each other and having a series of aligned holes therein and means engaging holes in two members for holding merchandise to be displayed at the front of the system, the improvement wherein the means for engaging the holes comprises:two side support elements, each extending from the rear to the front of the system when in a mounted position with one end at the rear having means forming members projecting transverse to the support elements and each projecting member inserted in one hole in one vertical member; means for releasably retaining the side support elements in the mounted position comprising a horizontal elongated stretcher member

having two downwardly depending pins and means disposed on each side support element for slidably receiving one pin;



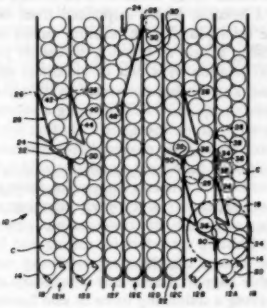
and means mounted on the side support elements for holding merchandise to be displayed.

4,705,176

ARTICLE VENDOR WITH ADJUSTABLE COLUMN TRANSFER PROVISION FOR ACCOMODATING LOCALLY-PREVALENT SPACE-TO-SALES RATIO

Kenneth W. Oden, Charles Town, W. Va., assignor to Dixie-Narco, Ranson, W. Va.

Filed Jul. 1, 1986, Ser. No. 880,730
Int. Cl.[4] A47F *7/28*
U.S. Cl. 211—59.2 **24 Claims**



1. A column transfer arrangement for use in a vendor for generally cylindrical articles such as cans of soft drink, which vendor has a bank of transversally spaced, vertically oriented columns each defined between two laterally opposite sidewalls, each two columns which adjoin one another in said bank of columns sharing a respective said sidewall, and the vendor further including a stack support means disposed at the base of each said column from which articles are to be dispensed directly to an outlet chute,

said column transfer arrangement comprising:

means defining at least one opening through at least one of said shared sidewalls, said opening being sized to permit lateral passage therethrough of a said article from one said column to an adjacent said column; and

for each said opening, there being provided alternately useful means mountable to said bank of columns for:

(a) closing said opening; and

(b) shunting articles contained in one said column above this shunting means, laterally through said opening, into said adjacent column, both said alternately useful closing means and shunting means being adapted to remain static while in use;

each said alternately useful means being adapted to be mounted to at least one respective said sidewall and each said sidewall of said one column and of said adjacent column including mounting means for mounting said alternately useful means thereto;

said mounting means on said sidewalls of said one column and of said adjacent column including at least one of:

slots through the respective said sidewalls, and

perimetrical lips of respective of said openings; and

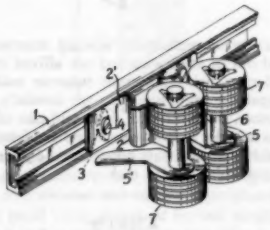
each of said alternately useful means being adapted to be mounted to respective of said sidewalls by being provided with at least one of hook means and channel means respectively for mounting with said slots and said lips.

4,705,177

DEVICE FOR HOLDING SKIS DURING STORAGE

Meir Oren, 149 Derech Salame, Tel Aviv, Israel

Filed Jun. 19, 1985, Ser. No. 746,986
Claims priority, application Israel, Feb. 17, 1985, 74363
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—70.5 **6 Claims**



1. A device for holding skis and other articles in a vertical position on a stationary support surface such as a wall, comprising a pair of separate holding members, each said holding member includes an upwardly arranged axially extending shaft, a pair of rollers mounted on said shaft and spaced apart therein in the axial direction of said shaft, said rollers being formed of a moderately yielding material, said rollers on one of said pair of holding members being in closely spaced relation with said rollers on the other one of said pair of holding members for holding skis therebetween, a separate spring arm for supporting each said holding member, a static member spaced from said rollers in the direction transversely of the axial direction of said shaft and shaped as a C-profiled runner bar arranged to be secured to a stationary support surface, each of said arms being adjustable secured to said static member for varying the spacing between said rollers on the different ones of said holding members and at least certain of said arms including a member in engagement with and extending from and transversely of said shaft to adjacent said static member for preventing said rollers and said shafts from tilting downwardly due to the weight of the skis or other articles held between the rollers by contacting the stationary support surface to which the static member is to be secured.

4,705,178

WIRE CUBE FOR USE IN A MODULAR DISPLAY RACK

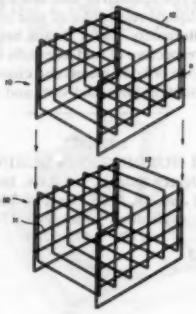
Kenneth E. Vail, Sr., 2560 Los Lomitas Way, Covina, Calif. 91724, and Kenneth E. Vail, Jr., 758 Level Ave., Covina, Calif. 91723

Filed May 14, 1986, Ser. No. 863,081
Int. Cl.[4] A47F *3/14*
U.S. Cl. 211—126 **1 Claim**

1. A wire cube comprising:

a. a pair of screens each of which is formed out of a steel grid

in which a plurality of steel wires are arranged both in vertical rows, each of which is spaced apart a particular distance from each adjacent vertical row, and in horizontal columns, each of which is spaced apart a particular distance from each adjacent horizontal column, wherein each of said vertical rows criss-crosses each of said horizontal columns, said steel grid being disposed on a rectangular member which is formed out of steel wire wherein said pair of screens are spaced apart; and



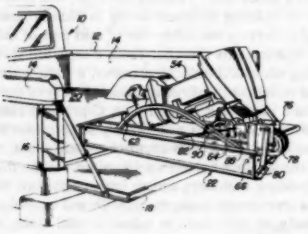
b. a plurality of rectangular spacing members which are formed out of steel wire and are affixed to said pair of spaced-apart pair of screens wherein said plurality of rectangular spacing members are coaxially aligned with each other, but are off-set from said pair of spaced-apart screens in order to from a male end and female end so that at least two of said wire cubes may be joined together to form a modular display rack.

4,705,179

EASY OUTBOARD MOTOR LOADER

Wilford D. Lathrum, 12555 Avondale Rd., Redmond, Wash. 98052

Filed Sep. 29, 1986, Ser. No. 912,299
Int. Cl.[4] B66C *23/62*
U.S. Cl. 212—182 **4 Claims**



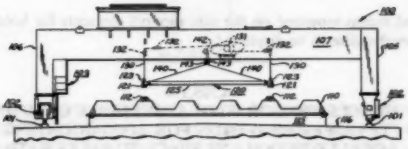
3. An outboard motor lift for use with a motor vehicle including fore-and-aft side walls and a floor defining a cargo bed having an open rear end, a loading and unloading device for transferring an outboard motor to and from the bed, comprising a rectangular frame adapted to rest on the bed floor below the level of the tops of the vehicle side walls and having a pair of fore-and-aft side sills and front and rear end members cross-connecting the sills, a boom disposed at the rear end member in a load-handling position and including an upright lower part and an overhanging upper part, means mounting the boom entirely on the frame and independently of the cargo bed and including an upright pivot carrying the boom lower part for swinging about a vertical axis from an inward position in which the overhanging part is above the frame to an outward position in which the overhanging part extends rearwardly of the frame, said means further including a transverse pivot mounting the boom for selective swinging out of its load-handling position to a folded position lying lengthwise of the frame and within the cargo bed, means for releasably locking the the boom in its load-handling position, a sheave on the overhanging part of the boom, and a winch carried by the frame and including a flexible element trained over the sheave and having a free end adapted for releasable connection to an outboard motor.

4,705,180

SUSPENDED LOAD POSITIONING STABILIZING SYSTEM

Gerald P. Lamer; Norbert W. Lenius, and Richard A. Stearn, all of Sturgeon Bay, Wis., assignors to Marine Travelift, Inc., Sturgeon Bay, Wis.

Filed Feb. 19, 1985, Ser. No. 702,835
Int. Cl.[4] B66C *23/52, 11/12*
U.S. Cl. 212—190 **3 Claims**



1. A hatch cover crane for removing and/or replacing a hatch cover carried upon a hatch coaming to close a ship's cargo hold opening comprising a movable support frame having an upper support member extending a width greater than the width of a hatch cover which is to be moved by the hatch cover crane, a hoisting frame suspended from said movable support frame by a plurality of hoisting cables said hoisting frame comprising a pair of hoisting spreaders positioned in spaced parallel relation by a pair of parallelly spaced struts, each one of said struts being connected at its opposite ends to one of said hoisting spreaders for forming a substantially rectangularlyshaped hoisting frame and including hook means for engaging a hatch cover to be moved, hoisting means carried by said movable support frame and coupled to said hoisting frame for effecting vertical movement thereof for raising and lowering the hatch cover relative to the hatch coaming, said hoisting means including a plurality of hoisting cables operatively connected to said hoisting spreaders for raising and lowering the hoisting frame formed thereby, and stabilizing means carried by said movable support frame and coupled to said hoisting frame for applying a stabilizing force to said hoisting frame to equalize uneven loading forces applied thereto during operation of said hoisting means and to maintain the vertical movement of the hatch cover perpendicular to the hatch coaming.

4,705,181

SAFETY CAP FOR CONTAINERS OF LIQUIDS

Peter A. Burke, Downingtown, Pa.; Walter Duering, Zurich, and Martin Gut, Duellikon, both of Switzerland, assignors to Kiwi Brands, Inc., North Douglasville, Pa.

Filed Sep. 5, 1986, Ser. No. 904,654
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—220 **11 Claims**

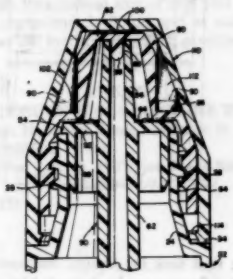
1. A safety cap for a liquid container, the container having an externally-threaded neck defining an axis, the safety cap comprising:

a nozzle disposed on the threaded neck, the nozzle defining a conduit for liquid and having a tubular protrusion of the conduit extending along the axis past the neck;

an inner cap having an inner surface and an outer surface, the inner surface being threaded to engage the neck, the inner surface having a sealing plug protruding into the

nozzle to seal the conduit at an end of the tubular protrusion, the outer surface having a plurality of teeth, spaced radially from the axis and circumferentially around the outer surface, each tooth having a trapezoidal cross section, the teeth having sloping sides oriented in a first direction around the cap, and relatively more-perpendicular sides oriented in an opposite direction around the cap; and,

an outer cap having an inner surface substantially conforming to the outer surface of the inner cap, the outer cap having an engagement part clasping the inner cap, the outer cap being thereby captive on the inner cap and



movable axially on the inner cap, the outer cap having a plurality of stops extending axially and radially inwardly toward the teeth of the inner cap, the stops of the outer cap engaging the more-perpendicular sides of the teeth when the outer cap is rotated to tighten the inner cap on the neck, the stops of the outer caps sliding over the sloping sides of the teeth and the outer cap being axially displaced from the inner cap when the outer cap is rotated in a direction to loosen the inner cap on the neck;

whereby axial pressure on the outer cap is required to move the inner cap and the outer cap and inner cap remain aligned to the neck.

4,705,182

INDICATOR DEVICE

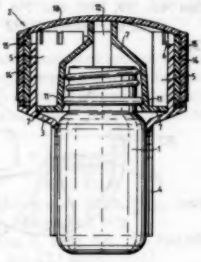
Jan Newel-Lewis, London, England, assignor to Alternate Resources PLC, United Kingdom

Filed Aug. 27, 1986, Ser. No. 900,785

Claims priority, application United Kingdom, Aug. 29, 1985, 21476

Int. Cl.⁴ B65D *55/12*

U.S. Cl. 215—230 **5 Claims**



1. An indicator device having a first cylindrical rotatable member, an aperture defined by the first member, a second cylindrical rotatable member arranged concentrically with respect to the first member, a third cylindrical member, the third cylindrical member being concentric with the first and second members, means coupling the first and second members for rotation together in a first direction of rotation from a first position of the first member in which access through the aperture is not possible to a second position of the first member in which access through the aperture is possible, means coupling the second and third members to prevent the rotation of the second member in the direction of rotation opposite to the first direction during the rotation of the first member from the second position to the first position and means to indicate the restoration of the first member to its first position after it has been rotated to the second position.

4,705,183

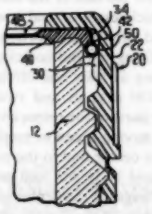
CORROSION RESISTANT CLOSURE CONSTRUCTION

John J. Moloney, Naperville, Ill., assignor to Continental White Cap, Inc., Northbrook, Ill.

Filed Aug. 27, 1986, Ser. No. 900,765

Int. Cl.⁴ B65D *41/04*

U.S. Cl. 215—276 **10 Claims**



1. An end panel for use in combination with a plastic fitment to form a composite closure, said end panel being formed of a metal subject to corrosion and having a peripheral cut raw edge, said end panel being improved by said peripheral edge terminating in a curl of which said cut raw edge is a terminal part and wherein said cut raw edge is at least in part masked by adjacent portions of said curl.

4,705,184

METAL CONTAINERS WITH SEAM HOLDING END CLOSURE THEREON

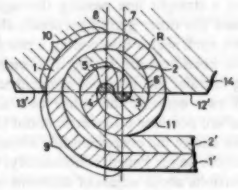
Takao Tsukamura, Funabashi, Japan, assignor to Nittetsu Steel Drum Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 620,793, Jun. 14, 1984, abandoned, which is a division of Ser. No. 469,572, Feb. 24, 1983, Pat. No. 4,543,025. This application Aug. 14, 1985, Ser. No. 766,068

Claims priority, application Japan, Feb. 26, 1982, 57-29044; Aug. 9, 1982, 57-137363

Int. Cl.⁴ B65D *8/08, 8/20*

U.S. Cl. 220—67 **7 Claims**



1. A metal container comprising: a body and an end closure closing at least one end of the body; and a seam at said one end of said body formed from seaming flanges extending outward in a radial plane from an edge portion of said body and from an edge portion of said end closure, said seam comprising, when viewed in cross section, two groups of concentric circular arc

portions each having two ends and concentric around two centers of curvature and constituted by the seamed flanges, said centers of curvature lying on a common center line extending across said seam and spaced from each other therealong a distance equal to one-half of the sum of the thickness of said body flange and said end closure flange, said flanges being contiguous to each other throughout the seam, said two groups of arc portions meeting on said common center line, both ends of the circular arc portions of one group of said two groups and both ends of at least one circular arc portion of the other group coinciding with said common center line, each end of each circular arc portion of one group of said two groups on each said flange, other than the extreme ends of said flanges and the ends where the respective portions join the body and the end closure, being joined continuously, at said common center line, to the corresponding next different size circular arc portion of the other group on the same flange along a common tangent and with a difference between the radius of curvature of each said arc portion of one group and the radius of curvature of each said arc portion of the other group of one-half of the sum of the thicknesses of said body flange and said end closure flange, said circular arc portions of one group having a center angle of 180 degrees and said circular arc portions of the other group having at least one circular arc portion with a center angle of 180 degrees and two circular arc portions constituted by the parts of the respective flanges on the outside of said seam and having a center angle of up to 180 degrees from said common center line to the points where the respective flanges join said body and said end closure, the extreme end edges of the flanges at the center of the seam and the inner surfaces of the portion of the flanges adjacent said extreme end edges defining a space at the center of the seam, and a sealing compound filling said space.

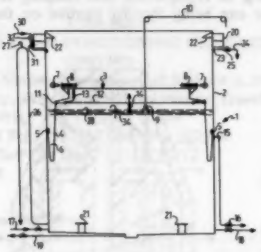
5. A metal container comprising: a body and an end closure closing at least one end of the body; and a seam at said one end of said body formed from seaming flanges extending outward in a radial plane from an edge portion of said body and from an edge portion of said end closure, said seam comprising, when viewed in cross section, two groups of concentric circular arc portions concentric around two centers of curvature and constituted by the seamed flanges, said centers of curvature lying on a common center line extending across said seam and spaced from each other therealong a distance equal to one-half of the sum of the thicknesses of said body flange and said end closure flange, said flanges being contiguous to each other throughout the seam, said two groups of arc portions meeting on said common center line, said two groups being constituted by four sectors composed of two sectors of one group of said two groups and two sectors of the other group, said two sectors of one group being defined by said common center line and a straight line passing through the center of curvature of said one group perpendicular to the common center line, said two sectors of the other group being defined by said common center line and a straight line passing through the center of curvature of said the other group perpendicular to said common center line, each sector comprising a plurality of concentric circular arc portions each having two ends, two adjacent sectors having circular arc portions concentric about the one center of said two centers, the other two adjacent sectors having circular arc portions concentric about the other of said two centers, the end of the corresponding circular arc portions of adjacent sectors being joined continuously, the ends of the circular arc portions about adjacent different centers and said sectors meeting on said common center line and being joined continuously at said common center line to the corresponding next different size circular arc portions in the other group, the extreme end edges of the flanges at the center of the seam and the inner surfaces of the portions of the flanges adjacent said extreme end edges defining a space at the center of the seam, and a sealing compound filling said space.

4,705,185

FLOATING ROOF TANKS FOR LIQUID, IN PARTICULAR TO STORAGE TANKS USED IN THE NUCLEAR POWER INDUSTRY

Claude Barbillat, Argenteuil, France, assignor to Electricite de France, France

Filed Sep. 26, 1985, Ser. No. 780,570
Claims priority, application France, Sep. 27, 1984, 84 14858
Int. Cl.[4] A45D *1/04*
U.S. Cl. 220—222 **5 Claims**



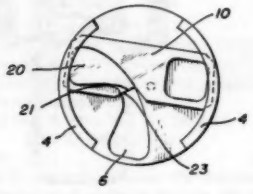
1. A floating roof tank for liquids, the tank comprising a cylindrical wall, a floating roof surrounded by said cylindrical wall, a flexible membrane connecting said floating roof to said wall in a watertight manner, said membrane defining together with the wall of the tank a space which is suitable for receiving a counter-pressure liquid, and the tank including the improvement whereby it is fitted with means for emptying the volume of counter-pressure liquid when the roof is in its high position, said emptying means being disposed in the upper portion of the tank in such a manner that the flexible membrane serves to expel the counter-pressure liquid under the effect of the pressure exerted on the membrane by the liquid contained in the tank, said emptying means including an emptying orifice passing through the wall of the tank in the upper portion thereof, said orifice being connected to a conventional emptying duct outside said wall, and said emptying means further including means for preventing said emptying orifice from being closed by the flexible membrane, such that a complete emptying of the counter-pressure liquid can be achieved.

4,705,186

CAN END ASSEMBLY

Marshall J. Barrash, Atlanta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Nov. 19, 1986, Ser. No. 932,353
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—269 **10 Claims**



1. A can end assembly for attachment to a can body comprising:

a cover portion for covering an end of the can body, said cover portion having a first opening therein,

seal means for closing said first opening, said seal means

being operatively connected to said cover portion adjacent the first opening by first hinge means;

a pull member having first and second distal ends and two side portions, one of said two side portions having a notch therein, second hinge means connecting said pull member to the seal means, said pull member and said seal means being movable about said first and second hinge means between a first position wherein said seal means closes the first opening and a second position wherein the first opening is substantially unobstructed by said seal means; and

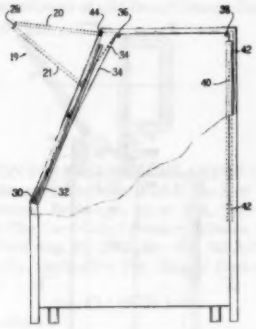
said pull member overlaying said seal means when in the first position, said seal means overlaying the pull member and said first hinge means folding into said notch in the second position, the longitudinal axis of said pull member being displaced approximately 90 degrees as said pull member moves from the first to the second position.

4,705,187

ENCLOSURE FOR A MACHINE TOOL

Thomas D. Linn, Holliston, Mass., assignor to Boston Digital Corporation, Milford, Mass.

Filed Jan. 16, 1987, Ser. No. 4,080
Int. Cl.[4] B65D *43/14, 51/04*
U.S. Cl. 220—333 **12 Claims**



1. An enclosure for a machine tool comprising:

a rear wall and two side walls of substantially equal height;

a front wall comprising:

a lower stationary partial wall;

top and bottom door sections connected to each other by a means for allowing said top and bottom door sections to pivot relative to each other about a pivot axis, said top door section also being connected to a top frame member by a means for allowing said top door to pivot from a closed, substantially vertical position to a substantially horizontal position;

whereby when said bottom door section is raised, the bottom and top door sections pivot towards one another and said top door section pivots in an upward direction until inner faces of said door sections form an acute angle.

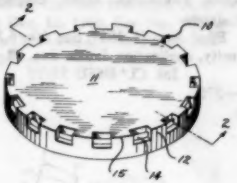
4,705,188

KEG CAP

Eckhard F. Rahn, Menomonee Falls, Wis., assignor to Miller Brewing Company, Milwaukee, Wis.

Filed Aug. 1, 1986, Ser. No. 893,006
Int. Cl.[4] B65D *51/16*
U.S. Cl. 220—367 **3 Claims**

1. In an identification cap for covering and protecting the open end of a Barnes neck of a malt beverage keg, which cap includes a circular central portion having a flat bottom surface for covering the open neck and a flat top surface for bearing identifying information; and, a skirt which depends downwardly from the periphery of said central portion and grips the outside of the Barnes neck, the improvement which comprises a plurality of vent openings extending through both the skirt and the central portion at the junction of said central portion



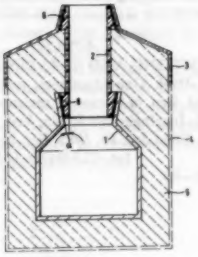
and said skirt so that fluids accumulating under said cap can escape to the outside by flowing both horizontally and vertically through said vent openings without blowing said cap off the Barnes neck.

4,705,189

DOUBLE WALLED INSULATED CONTAINER FOR STORING LOW BOILING LIQUIFIED GASES

Friedel Theissen, Erkelenz, and Heinrich Fieseler, Dormagen, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Fed. Rep. of Germany

Filed Jun. 16, 1986, Ser. No. 874,385
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1985, 3525464
Int. Cl.[4] B65D *25/02*
U.S. Cl. 220—465 **3 Claims**



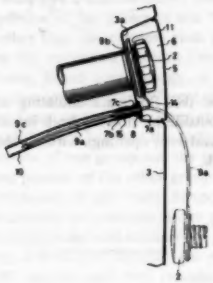
1. In a double walled insulated container for storing low boiling liquified gases with an inner container made of a metal selected from the group consisting of aluminum and steel, an outer container with insulation between the two containers, a neck tube made of plastic for connecting the openings of the two containers as well as glued joints between the neck tube the respective container openings, the improvement being in that each of said joints between said neck tube and the respective container openings being in the form of conical seated joint connected to said neck tube and having an angle of inclination between 1° and 20° whereby the respective container openings are shrink fitted onto said neck tube and a thin adhesive is applied to the conical surface of said joint, and each of said joints extending outwardly from said neck tube and having a maximum diameter greater than the diameter of said neck tube.

4,705,190

DEVICE FOR HOLDING AUTOMOBILE FUEL-TANK FILLER PORT CAP

Akira Mizusawa, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Jan. 23, 1987, Ser. No. 6,369
Claims priority, application Japan, Jan. 28, 1986, 61-14726
Int. Cl.[4] B65D *55/16*
U.S. Cl. 220—375 **3 Claims**



1. A device for holding a fuel-tank filler port cap, comprising:

a mounting member mounted in a through hole formed in an automobile body near a fuel-tank filler port; and

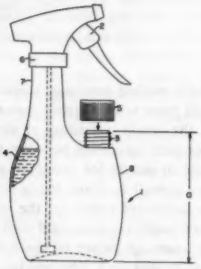
a string-like connecting member insertedly retained in said mounting member such that it can be partially withdrawn therefrom, said connecting member being provided at one end with means for retaining it against detachment from said mounting member and provided at the other end with a ring-like portion for holding said cap, said connecting member being retreatedly accommodated into the interior of the automobile body through said mounting member when said cap is fitted and being withdrawn to hold the cap in the hanging state when said cap is removed.

4,705,191

MIXING AND SPRAYING DEVICE

Hansbelmut Itzel, Gau-Algesheim, and Volker Barth, Alzey, both of Fed. Rep. of Germany, assignors to Celamerck GmbH & Co. KG, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Jul. 29, 1985, Ser. No. 760,127
Int. Cl.[4] B67D *5/40*
U.S. Cl. 222—80 **3 Claims**



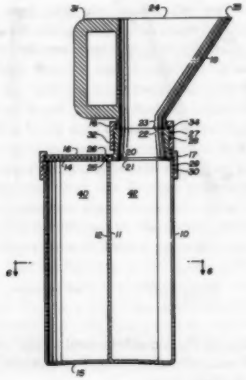
1. A diluting and dispensing container for diluting a chemical concentrate therein and dispensing the diluted concentrate therefrom, said container comprising a container body having a relatively wide bottom which narrows upwardly into a neck opening having dispensing pump means mounted thereon, said container body defining a diluting compartment adapted to be partially filled with a liquid diluent to provide a volume of diluent and a discrete volume of air within said diluting compartment, an externally threaded fill opening for introducing said diluent into said diluting compartment, said fill opening being located on the container body in proximity to the air/diluent interface, an internally threaded closure cap threadedly engaged for closing and opening rotation with said fill opening, a removable frangible capsule containing a dilutable chemical concentrate seated in said fill opening, said capsule adapted to be ruptured in response to the closing rotation of said closure cap on said fill opening and thereby permit contact between said concentrate and said diluent, and a dip tube attached to and in communication with said dispensing pump means and with the diluting compartment for withdrawing the diluted concentrate from the compartment.

4,705,192

REUSABLE MULTI-COMPARTMENT CONTAINER WITH CHARGING AND DISCHARGING MEANS

Paul A. Knapton, 619 Bay Ridge Ave., Brooklyn, N.Y. 11220

Filed May 27, 1986, Ser. No. 866,942
Int. Cl.[4] B67D *5/60*; B65B *1/04*
U.S. Cl. 222—144.5 **4 Claims**



1. A multi-compartment container with a flow directing means for charging and discharging comprising: an outside wall of symmetrical regular shape and of substantial height having partitions of the same height which are angularly offset from one another and extend inwardly from said outside wall to converge at a common longitudinal axis of the container, said partitions forming a plurality of sealed compartments of sector-like configuration with said outside wall; a base forming a means of closure of symmetrical regular shape secured to one end of said outside wall and partitions; a top closure forming a means of covering the other end formed by said outside wall and partitions, and which is provided with a plurality of apertures concentrically arranged about and spaced from said longitudinal axis of the container thus providing a means of passage from each compartment, and a protuberant surface on said closure raised above a plane defined by an upper horizontal surface of the top closure and being coaxial with said longitudinal axis; a rotatable compartment access selector with a horizontal surface of regular shape covering the top closure and containing a recessed depression centrally located on the underside to mate with said protuberant surface and therein, an access aperture of identical geometrical shape as said top closure apertures and radially spaced from said longitudinal axis such that said access aperture is alignable with said top closure apertures, and a tubular cylindrical raised neck portion on said access selector extending upwardly therefrom and inscribing

the access aperture, and which terminates in a top aperture at the opposite end; a selector linkage providing a means of adjusting contact pressure between the top closure and compartment access selector by the use of a ring placed over the top horizontal surface of said selector with a flange depending from the periphery of the ring and which detachably engages said outer wall by means providing longitudinal adjustment of said flange axially of said container outer wall; a funnel shaped structure with an elliptical main opening having a lip and a handle on opposing sides of the main opening and which tapers downwardly to a smaller minor opening and having a base flange radially extending therefrom with an outside diameter equal to an outside diameter of said raised neck portion at the top thereof, said base flange being in contact with and coplanar with a upper horizontal surface of said raised neck defined by the top thereof, providing for a rotational placement of said handle and lip portions relative to said outside wall in at least two positions; a funnel linkage providing a means of adjusting contact pressure between the base flange of the funnel shaped structure and upper horizontal surface of the raised neck portion of the compartment access selector by the use of a ring placed over the top horizontal surface of the base flange with a flange depending from the periphery of the ring and which detachably engages said tubular portion by means providing longitudinal adjustment of said funnel linkage flange axially of said tubular portion.

4,705,193

CIRCULATION PUMP SYSTEM IN A STORAGE VESSEL

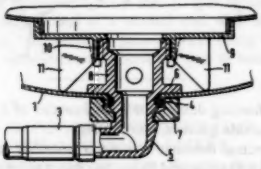
Matthias Aschberger; Karlheinz Färber, both of Giengen, and Anton Deininger, Bachhagel, all of Fed. Rep. of Germany, assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Aug. 22, 1985, Ser. No. 768,367

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1984, 3430952

Int. Cl.[4] B67D *5/62*

U.S. Cl. 222—146.6 **3 Claims**



1. A circulation pump system in a storage vessel for a beverage dispenser comprising:

a storage vessel for storing soda water, a mixture of CO_2 and fresh water, under pressure;

means for cooling the soda water contained in said storage vessel to the point of frost formation on the walls of the vessel;

said storage vessel having a discharge port;

a wall duct connection secured to said storage vessel for the discharge of the soda water;

said wall duct connection passing through said discharge port and having an outlet opening within said storage vessel;

a circulation pump located completely in said storage vessel and supported by an interior liquid holding portion of said storage vessel directly above said discharge port; and

said circulation pump having a bottom area spaced from said storage vessel and overlying said outlet opening.

4,705,194

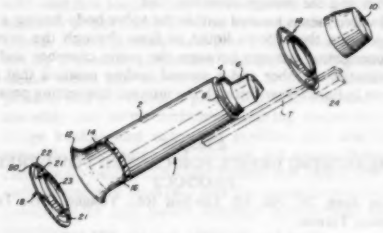
TOOTHBRUSH HOLDER ATTACHMENT FOR TOOTHPASTE TUBES

Joseph Judge, 1660 E. 12th St., Brooklyn, N.Y. 11229

Filed Dec. 12, 1986, Ser. No. 941,068

Int. Cl.[4] A47G *29/08*; B67D *5/06*

U.S. Cl. 222—192 **5 Claims**



1. A cylindrical walled toothpaste container in combination with a detachable toothbrush holder;

said toothpaste container having a base permitting free-standing of the container, the base of the container being open and the cylindrical wall of the container together with said open base defining a cavity;

said toothbrush holder comprising: a substantially annular portion and a toothbrush holding means for holding toothbrushes, said toothbrush holding means extending outwardly from said annular portion, said annular portion having an inside surface for engagement with an external portion of the container for mounting the holder thereon in a toothbrush and an outside surface for frictional engagement with an internal surface of the cylindrical wall of the container within said cavity for storing said toothbrush holder in a position of non-use.

4,705,195

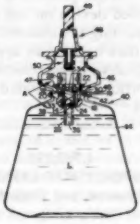
VALVE APPARATUS FOR LIQUID DISPENSERS

Samuel C. Heck, San Antonio, Tex., assignor to Sani-Fresh International, Inc., San Antonio, Tex.

Continuation-in-part of Ser. No. 653,341, Sep. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 592,945, Mar. 23, 1984, Pat. No. 4,640,638, which is a continuation-in-part of Ser. No. 478,516, Mar. 24, 1983, Pat. No. 4,534,669. This application Jan. 24, 1986, Ser. No. 822,029

Int. Cl.[4] B65D *37/00*

U.S. Cl. 222—207 **7 Claims**



1. A liquid dispenser comprising:

(a) a storage chamber;

(b) a pump chamber having one end connected to the storage chamber through a first passage and having at its other end an outlet orifice for discharging liquid from the dispenser;

(c) a valve body extending through and cooperating with

the first passage, the valve body having a first position which allows liquid to flow around the valve body and between the pump chamber and the storage chamber and having a second sealing position that prevents liquid flow around the valve body and between the pump chamber and the storage chamber, said valve body having a means for blocking liquid flow in said second sealing position and an internal connecting passage between the pump chamber and the storage chamber; and

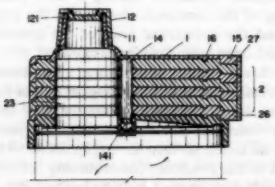
(d) valve means located within the valve body having a first position that allows liquid to flow through the internal connecting passage between the pump chamber and the storage chamber and a second sealing position that prevents liquid flow through the internal connecting passage.

4,705,196

MEASURING DEVICE FOR CANNED POWDERED PRODUCT

Marco Jang, 3F, No. 69, Lin-Sen Rd., Yungho City, Taipei Hsien, Taiwan

Filed Jan. 28, 1986, Ser. No. 823,366
Int. Cl.[4] G01F *11/28*
U.S. Cl. 222—439 **7 Claims**



1. A device for quantitative measurement of powered product such as milk powder from a can container, comprising a stack of tiers of trays or rings including: a top ring, a bottom ring and a plurality of intermediate rings, and characterized in that: each ring having its half circle excavated to form a hollow storage space, the rest portion remaining solid; the top ring having a cylindrical outlet communicatable to its hollow storage space so that the storage capacity is increased; the bottom ring having a tapered guide surface leading from its solid portion toward the hollow storage space to facilitate pouring of the product content into the hollow storage space, each ring is rotatably and coaxially mounted with its preceding and/or succeeding ring, a shaft is stemmed under the center of the top ring and a center opening is provided to each of the intermediate rings, said shaft is to pass through said openings and rest in a center seat on the bottom ring, dispensing of quantitative measurements of powdered product is accomplished by first attaching the assembled device on top of an open end of the container can, then turning the attached device with can container upside down, then rotating an appropriate ring so that a predetermined quantitative measurement of product is trapped between the solid portion of the rotated appropriated ring and the cylindrical outlet.

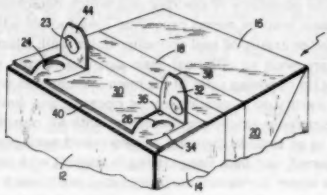
4,705,197

POUR SPOUT FOR CONTAINERS

Robert L. Gordon, Monroe, and Roderick W. Kalberer, Salisbury Mills, both of N.Y., assignors to International Paper Company, Purchase, N.Y.

Filed Jul. 29, 1986, Ser. No. 890,232
Int. Cl.[4] B67D *3/00*; B65D *47/00, 5/72*
U.S. Cl. 206—604 **6 Claims**

1. A frangible seal construction for a container formed from paperboard, the container adapted to carry a liquid therein, such as a potable liquid, the container having a flat wall portion and an aperture extending through said flat wall portion, a rupturable barrier layer seal on the interior wall surface, the barrier layer covering the container wall aperture, a rigid strip having a rigid flap integrally hinged thereto, the flap normally lying in the plane of the rigid strip and formed from the rigid strip by cut lines in the rigid strip, said rigid strip being sealed to the exterior surface of the container at said flat wall portion with said flap overlying said aperture, the container innermost



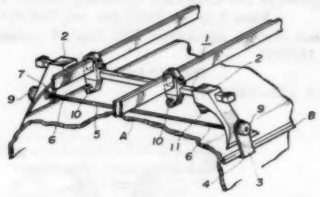
surface of said flap being adhesively secured to said barrier layer seal through said opening, whereby when the flap is pivoted the barrier layer seal is broken and the contents of the container can be dispensed through the aperture and whereby said rigid flap can be reclosed to frictionally fit back within said rigid strip.

4,705,198

REINFORCED ROOF CARRIER STRUCTURE FOR A VEHICULAR AUTOMOBILE

Masashi Kamaya, Tokyo, Japan, assignor to Piaa Corporation, Tokyo, Japan

Filed Jun. 20, 1986, Ser. No. 876,429
Int. Cl.[4] B60R *9/00*
U.S. Cl. 224—329 **2 Claims**



1. a reinforcing device for a roof carrier of a vehicle having a roof with side gutters, comprising:

a reinforcing member having a crossbar having opposite ends for placing and fixing an object to be carried thereon;

a pair of stands slidably mounted to said opposite ends, respectively, for supporting said crossbar on said vehicle roof, said stands having holes extending therethrough;

a pair of mounting members having means for engaging said gutters and being separate from said pair of stands for securing said pair of stands on said vehicle roof, said mounting members having holes extending there through in alignment with the holes in said stands;

a wire made of a flexible material;

first and second metal members respectively coupled to opposite ends of said wire;

a screw rod prcjecting outward from each of said metal members, wherein said screw rods extend through said holes formed in said stands and in said mounting members in the vicinity of end portions thereof; and

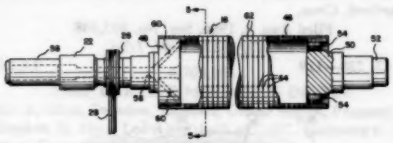
first and second clamp nuts engaged with threaded portions of said screw rods and contacting an outer side portion of said mounting members, thereby to clamp said roof carrier to said vehicle roof.

4,705,199

VACUUM DRUM FOR SECURING A FILM THERETO

John L. Herman, Huber Heights; Robert A. Dessert, and Dinesh G. Punater, both of Dayton, all of Ohio, assignors to Harris Graphics Corporation, Melbourne, Fla.

Filed Jun. 28, 1985, Ser. No. 750,814
Int. Cl.[4] B65H 20/12
U.S. Cl. 226—95 13 Claims



4. A rotatable drum for securing thereto a sheet of film by suction provided from a source of partial vacuum, said drum comprising:

a cylindrical body defining an inner and an outer surface and a central axis for said drum;

first and second circular end blocks connected to said cylindrical body for closing said body, each of said end blocks defining an inner face disposed within said drum;

means connected to said first and second blocks for mounting said drum for rotation;

said cylindrical body defining on said outer surface thereof a plurality of parallel, identical grooves extending circumferentially about at least a portion of said body, each of said grooves defining a cross-sectional area;

said body further defining a plurality of holes extending therethrough, each of said holes opening on said outer surface into one of said grooves, each of said holes further defining a cross-sectional area approximately equal to the cross-sectional area of one of said grooves;

said first block defining concentrically therethrough a central passageway;

means for connecting said central passageway to the source of partial vacuum, whereby said drum may be partially evacuated; and

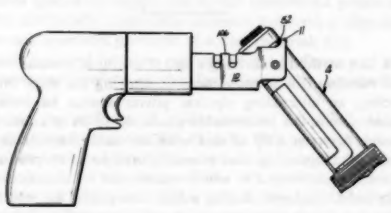
said first block further defining a plurality of auxiliary passageways, each of said auxiliary passageways opening at a first end through said inner face closer to said inner surface of said cylindrical body than to said central passageway, and connecting at a second end with said central passageway, said auxiliary passageways being within said first block symmetrically about the axis of said drum.

4,705,200

PIVOT-LOAD POWDER ACTUATED TOOL WITH FIRING CHAMBER INSERT

Rowland J. Kopf, deceased, late of Southington (by Virginia G. Kopf, heiress), and William C. Flynn, Northford, all of Conn., assignors to Uniset Corporation, Indianapolis, Ind.

Filed Feb. 8, 1985, Ser. No. 699,808
Int. Cl.[4] B25C 1/10, 1/12, 1/18
U.S. Cl. 227—9 21 Claims



1. A powder actuated tool comprising:

(a) a housing member;

(b) a breech member mounted in said housing member;

(c) lug means on said housing member; and

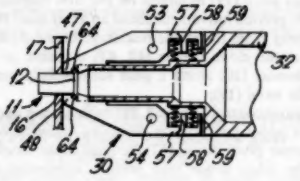
(d) a barrel assembly mounted on said housing member, said barrel assembly including first longitudinal slot means receiving said lug means and enabling longitudinal movement of said barel assembly between breech open and breech closed positions, and said barrel assembly further including first circumferential slot means communicating with said first longitudinal slot means enabling said barrel assembly to be rotated about its axis when disposed in said breech closed position, said first longitudinal slot means having a closed breechward end for receiving said lug means when said barrel assembly is in a breech open position and providing a pivot stop whereby said barrel assembly can be pivoted about said lug means to a cartridge loading and unloading position, and said barrel assembly also comprising cocking slot means communicating with said first circumferential slot means and providing means for receiving said lug means during cocking movement of said barrel assembly against said breech member.

4,705,201

NOSEPIECE FOR APPARATUS FOR INSTALLING FASTENERS

Ralph H. Bennett, Poole Dorset, England, assignor to Avdel Limited, Hertfordshire, England

Continuation of Ser. No. 841,686, Mar. 19, 1986, abandoned, which is a continuation of Ser. No. 523,439, Aug. 16, 1983, abandoned. This application Aug. 20, 1986, Ser. No. 898,831
Claims priority, application United Kingdom, Aug. 20, 1982, 8224046
Int. Cl.[4] B21J 15/30, 15/32, 15/34
U.S. Cl. 227—55 11 Claims



1. A nosepiece for an apparatus for installing fasteners having a radial enlargement, which nosepiece comprises:

a split support provided by a plurality of support members positionable in a support position to define between them a cavity which receives the fastener and supports the fastner peripherally, which support members can move from said support position to allow the movement of a fastener therethrough in a forwards direction from the back to the front thereof to be installed;

and fastener restraining means having means cooperating with the radial enlargement of a fastener for restraining undesired movement of a fastener in the cavity both in the forwards direction and in the reverse direction from the front to the back thereof when said fastener restraining means is in a restraining position and a fastener is in said cavity for support by said support members;

the fastener restraining means including means responsive to movement of a fastener in the forwards direction into said cavity for moving said fastener restraining means from said restraining position, while said support members remain in said support position, to allow a fastener to enter said cavity in the forwards direction, and means to return said fastener restraining means to said restraining position to restrain said fastener against undesired movement in both the forwards and the reverse direction;

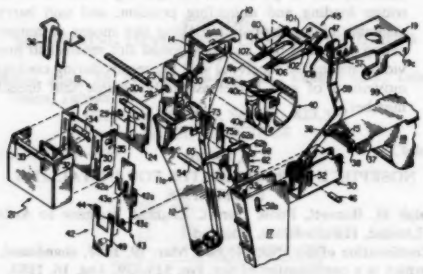
the fastener restraining means also being movable from said restraining position in unison with movement of the support members from said support position to allow movement of the fastener in the forwards direction.

4,705,202

CARTRIDGE PLIER STAPLER

Paul Olesen, Bellmore, and Frank H. Lin, Jackson Heights, both of N.Y., assignors to Swingline Inc., Long Island City, N.Y.

Filed Jun. 27, 1986, Ser. No. 879,764
Int. Cl.[4] B25C *5/02, 5/04*
U.S. Cl. 227—153 **4 Claims**



1. A hand-held tool having an anvil (19), a housing (11) including a staple cartridge (18), a first rearward handle (12) and a staple discharge channel (20) and a second forward handle (17) mounted on the first handle (12) which tool provides space between the discharge channel (20) and anvil (19) to receive the workpiece, the improvement comprising

(a) an anvil (19) mounted on the first rearward handle (12) for pivotal movement about an anvil axis (19*a*) toward and away from the staple discharge channel (20);

(b) staple drive means (42, 43) movable in the discharge channel (20) along a path substantially perpendicular to the anvil (19);

(c) anvil control arms (58, 59) each having end portions with an upper end portion pivotally mounted on the anvil on upper pivot means (57) forward of the anvil axis (19*a*) and the other lower end portion connected to the second forward handle;

(d) handle mounting means (54, 52*a*, 53*a*, 46) on the first handle for mounting the second handle including (a) a guide rod (54) fixed to the first handle (12) and positioned in slots (52*a*, 53*a*) formed in the second handle (17) and including (b) forwardly positioned pivotal connector means (46) located forward of the upper pivot means (57) for connecting the lower ends of the anvil control arms (52*a* 53*a*) to the second handle (17) such mounting means permitting the second hand (17) to move down and rearwardly with the anvil (19) and to rotate relative to the first handle (12) until the anvil engages the workpiece;

(e) driver link means (62) pivotally connected to the second handle (17) about pin (72) means positioned rearward of the pivotal connector means (46) and the link means (62) including slide projection means (68) and such link means (62) slidably mounted on the first handle (12) for movement up and down on the first handle (12); and

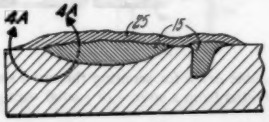
(f) non-pivotal connector means (50) for connecting the staple drive means (42, 43) to the driver link means (62) with the connector means (50) and slide projection means (68) movable up and down in spaced-apart parallel paths, one path (73, 73*a*) being forward of the other path (42, 43) whereby the anvil (19) is first brought against the workpiece and thereafter the second handle (17) is rotated about the pivotal connector means (46) of the lower ends of the anvil control arms (58, 59) until the driver link means (62) slides upwardly to raise the staple driver means (42, 43) a sufficient distance to drive the staple.

4,705,203

REPAIR OF SURFACE DEFECTS IN SUPERALLOY ARTICLES

Charles C. McComas, Stuart, and Dennis C. Stewart, Palm City, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 4, 1986, Ser. No. 892,688
Int. Cl.[4] B23P *6/04, 1/04*
U.S. Cl. 228—119 **2 Claims**



1. Method of repairing surface defects in superalloy articles including the steps of

a. preparing the article substrate surface by removing contamination,

b. plasma spraying a first material into the defect area to fill the defect, said first material having a composition similar to that of the substrate being repaired except that from 1–4% boron has been added to depress the melting point,

c. plasma spraying a layer of a second material over the first material, said second material having a melting point which approximates or exceeds that of the substrate,

d. heating the article to a temperature which melts said first material without melting said substrate or said second material and holding at that temperature until isothermal solidification occurs,

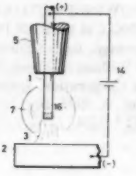
e. removing at least said second material.

4,705,204

METHOD OF BALL FORMING FOR WIRE BONDING

Jitsuho Hirota; Kazumichi Machida, and Noriko Watanabe, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1986, Ser. No. 824,744
Claims priority, application Japan, Mar. 1, 1985, 60-40624; Mar. 8, 1985, 60-47034; Mar. 13, 1985, 60-49785; Mar. 13, 1985, 60-49786; Mar. 13, 1985, 60-49787
Int. Cl.[4] H01L *21/60*
U.S. Cl. 228—179 **8 Claims**



1. In a method of forming a ball at the tip of a metal wire for ball bonding, the improvement comprising the steps of: connecting an alternating electric power source between said metal wire and a consumable electrode so as to cause a discharge between a tip of said wire and said consumable electrode, and operating said power source so as to produce an alternating voltage for which an amount of electric energy supplied to said wire during a first time period for which said wire is positive with respect to said consumable electrode is larger than an amount of energy which is supplied to said wire during a second time period for which said wire is negative

with respect to said consumable electrode, thereby melting said tip and accurately shaping it into a ball.

4,705,205

CHIP CARRIER MOUNTING DEVICE

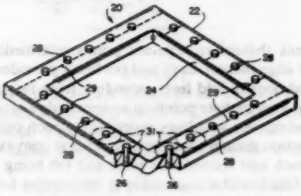
Leslie J. Allen, Swindon, England; Gabe Cherian, Fremont, and Stephen H. Diaz, Los Altos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 509,684, Jun. 30, 1983. This application May 14, 1984, Ser. No. 610,077

The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.

Int. Cl.[4] H01L *21/60, 21/58*

U.S. Cl. 228—180.2 27 Claims



1. A device for providing a plurality of discrete quantities of preformed solder material for forming connections between electrically conductive elements comprising:

a retaining member having a plurality of apertures therein spaced to correspond to preselected points on the electrically conductive elements; and

preforms of solder material disposed in or supported by the apertures whereby the ends of the preforms are adapted to contact preselected points on the electrically conductive elements and wherein the solder material comprises filled solder which contains from about 20% to about 80% by weight based on the total weight of the solder-filler mixture of a filler which is solid at a temperature at which the solder is molten or supported solder and wherein the filled solder or supported solder, separate from the retaining member and apertures thereof, substantially retains its preform physical shape while the solder is in a molten state.

17. A method for forming a resilient connection for connection preselected points of first and second electrically conductive elements comprising:

positioning a first electrically conductive element in alignment with one side of a retaining member having apertures spaced to correspond to the preselected points on the electrically conductive elements and having disposed in said apertures preforms of solder material; and

effecting a bond between one end of the preforms and the preselected points on the first electrically conductive element;

wherein the preforms of solder material are filled solder containing from about 20% to about 80% by weight based on the total weight of the solder-filler mixture of a filler which is solid at a temperature at which the solder is molten or supported solder which, separate from the retaining member and apertures thereof, substantially retains its preform physical shape while the solder is in a molten state.

4,705,206

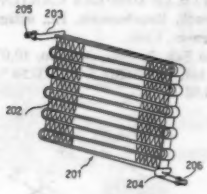
METHOD FOR BRAZING A MAGNESIUM-CONTAINING ALUMINUM ALLOY

Hiroshi Kamiya, Toyohashi; Takeshi Iguchi, Gifu, and Shigenobu Fukumi, Oubu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 18, 1985, Ser. No. 810,295

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—183 8 Claims



1. A method for brazing a magnesium-containing aluminum alloy, comprising:

(a) providing an element made of said alloy and having magnesium distributed generally evenly throughout at a concentration level which exceeds a predetermined threshold value;

(b) thereafter, subjecting said element to a treatment operation for reducing said magnesium concentration level only in a surface portion of at least a connection site on said element to no higher than said predetermined threshold value;

(c) thereafter, depositing brazing material on said element in the vicinity of said connection site;

(d) thereafter, cladding said brazing material with a potassium fluoaluminate flux; and

(e) thereafter, heating said element and said brazing material sufficiently to melt said brazing material at said connection site.

4,705,207

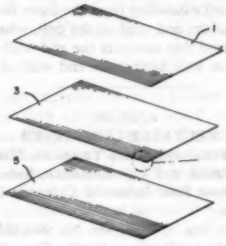
METHOD OF BRAZING COLUMBIUM TO ITSELF USING LOW BONDING PRESSURES AND TEMPERATURES

Brian Norris, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Oct. 16, 1986, Ser. No. 919,760

Int. Cl.[4] B23K *1/04, 35/32*

U.S. Cl. 228—194 16 Claims



1. A method of bonding columbium to itself comprising the steps of:

(a) providing a first thin sheet of columbium,

(b) providing a second member of columbium,

(c) providing a brazing foil of titanium having a coating thereon taken from the class consisting essentially of copper alone, nickel alone or layers of copper and nickel,

(d) placing said first sheet and second member in intimate contact with opposite surfaces of said brazing foil,

(e) heating the arrangement of (d) to a temperature above the eutectic temperature of the compositions of said foil and/or said coating and no higher than about 1750° F. for about 90 minutes; and

(f) cooling the arrangement of (e) to ambient temperature.

4,705,208

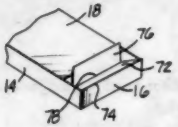
ARTICLE DISPLAY CARTON

Randall A. Kiedaisch, Bourbonnais, Ill., assignor to Manville Corporation, Denver, Colo.

Filed Feb. 2, 1987, Ser. No. 10,072

Int. Cl.[4] B65D *5/26, 25/54*

U.S. Cl. 229—120.08 **12 Claims**



1. A multiple article display carton containing at least one cell for receiving articles to be packaged and displayed, wherein each cell has a bottom wall connected to side walls and end walls, the carton comprising:

a top panel containing a cutout associated with each cell, enabling the contents of the cell to be viewed,

side panels connected to the top panel, each side panel comprising a side wall of a cell,

at least one of the end walls of each cell comprising a flap foldably connected to the bottom wall of the cell,

the side panels of the carton extending a substantial distance beyond the end wall of their associated cell and having a flap foldably connected thereto, the side panel flaps extending transversely of the side panels and being substantially parallel to and spaced from the end wall of their associated cell,

the top panel of the carton extending beyond the aforesaid end wall of the cell and having a first foldably connected flap contacting the outer faces of the side panel flaps to form a part of the end panel of the carton,

the top panel having a second flap foldably connected to the first flap and contacting the inner faces of the side panel flaps to complete the formation of the end panel of the carton,

the top panel having a third flap foldably connected to the second flap and extending from the inner faces of the side panel flaps to the end wall of the cell, whereby the free end of the third flap contacts the end wall of the cell to form a friction lock against the end wall of the cell.

4,705,209

ERECTABLE CONTAINER

Takeo Fujihara, Takatsuki; Akira Yamatani, Minoo; Masanori Yamamoto, Kaizuka, and Yuji Kunimoto, Kobe, all of Japan, assignors to House Food Industrial Company Limited, Higashiosaka, Japan

Filed Sep. 8, 1986, Ser. No. 904,353

Claims priority, application Japan, Sep. 10, 1985, 60-138626[U]

Int. Cl.[4] B65D *5/24*

U.S. Cl. 229—109 **2 Claims**

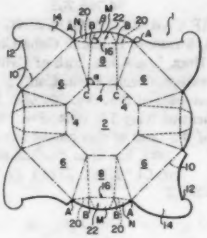
1. An erectable container formed by folding a single base board and comprising:

a bottom surface made in a polygonal form having more than six sides of an even number,

first and second side plates alternately integrally extending from each side of the bottom surface via respective concave fold lines therebetween,

a lid plate integrally provided on each said first side plate at an upper edge thereof opposite said concave fold line, each lid plate being hook-shaped at an upper edge thereof, and

a tab integrally provided on each said second side plate at an upper edge thereof opposite the concave fold lines, each said second side plate being provided with two inclined first convex fold lines extending from respective lower



vertexes thereof to separate points intermediate of the upper edge thereof, each said tab being provided with two second convex fold lines extending from respective ones of said intermediate points to an upper edge of said tab, the second convex fold lines approaching each other with an inclination greater than that of said first convex fold lines, and each said second side plate and tab being connected via a fold line that is concave at the portion between said intermediate points and is convex at the remaining portions.

4,705,210

ELECTROMAGNETICALLY ACTUATABLE VALVE

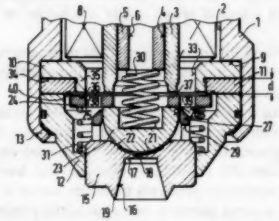
Franz Graser, Bamberg; Werner Langer, Litzendorf, and Reiner Nowak, Bamberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 810,632, Dec. 19, 1985, abandoned. This application Feb. 4, 1987, Ser. No. 11,402

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511463

Int. Cl.[4] B05B *1/30*; F02M *51/06*

U.S. Cl. 239—585 **5 Claims**



1. An electromagnetically actuatable valve for fuel injection systems in internal combustion engines, comprising a valve housing **1** of ferromagnetic material having a longitudinal axis and provided with fuel inlet means, at least one magnetic coil **8** mounted on a core **3** of ferromagnetic material disposed axially of said housing, an armature **24** in close proximity to a valve closing element **23** adapted to open and close a fuel outlet means associated with a valve seat **22** upon excitation of said magnetic coil, an annular disk **10** having a predetermined height disposed in said housing **1** relative to a stop shoulder **9**,

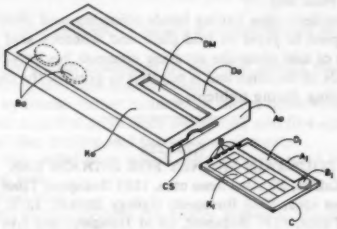
said annular disk further being provided with a collar **35** extending toward said armature and defining annular inner and outer walls, said annular inner wall defining a first diameter, said annular outer wall having a height and arranged to receive an annular stop disk **11** having an outward face portion **40**, said annular stop disk **11** having a height "d" greater than said height of said annular outer wall, said annular stop disk **11** being arranged to extend beyond said annular outer wall upon being received thereby, said annular stop disc **11** then being adjacent to said armature, said annular stop disk **11** having means defining a central aperture, said central aperture defining a second diameter, said armature **24** having a diametrical extent greater than said first diameter of said annular disk **10** and greater than said second diameter of said annular stop disk **11**, said outward face portion of said annular stop disk **11** serving as a stop for said armature upon excitation of said magnetic coil and movement of said armature axially to open said valve, the height of said annular stop disk **11** being greater than that of said annular outer wall of said collar prohibits said armature from touching said annular disk and said core, whereby a first remnant air gap **38** is defined between said annular disk and said armature and a second remnant air gap **39** is defined between said armature and said core.

4,705,211

CARD-TYPE DATA TERMINAL OPERATIVELY CONNECTABLE TO ELECTRONIC APPARATUS

Toshio Honda, Yao, and Kosuke Nishimura, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 5, 1985, Ser. No. 708,543
Claims priority, application Japan, Mar. 7, 1984, 59-33274[U]
Int. Cl.⁴ G06K *5/00*
U.S. Cl. 235—380 **13 Claims**



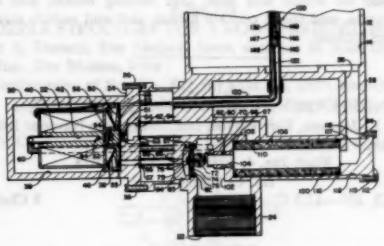
1. A compact data terminal system comprising:
a portable electronic apparatus, comprising,
a housing,
first means, disposed in said housing, for displaying data,
keyboard means, disposed in said housing, for operating said portable electronic apparatus,
processing means for carrying out operations entered by said keyboard means, and
external terminal storing portion disposed in said housing; and
a card-type external terminal, comprising,
memory means for storing data,
second keyboard means for entering data into said memory means,
second processing means for manipulating data entered by said second keyboard means, and
connector means for electrically and mechanically connecting said card type external terminal to said portable electronic apparatus at said external terminal storing portion.

4,705,212

METHOD AND APPARATUS FOR MANAGING STEAM SYSTEMS

Charles E. Miller; Robert L. Poland, both of Boulder, and Louis T. Yoshida, Longmont, all of Colo., assignors to Engineering Measurements Co., Longmont, Colo.

Filed Dec. 27, 1983, Ser. No. 565,362
Int. Cl.⁴ F16T *1/02*
U.S. Cl. 236—54 **59 Claims**



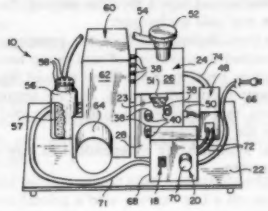
1. Steam system management apparatus, comprising:
a reservoir having an inlet adapted for connection to a steam distribution system and an outlet;
electronically actuated valve means for opening and closing said outlet;
thermal electric generator means for converting heat energy in the steam system into electrical energy for operating said electronically actuated valve means; and
temperature control means for limiting the temperature of the heat applied to said thermal electric generator means.

4,705,213

HEAT UNIT RECYCLER

Elvin Lane, 119 N. Superior, P.O. Box 1624, Hutchinson, Kans. 67501

Filed Jan. 27, 1986, Ser. No. 823,032
Int. Cl.⁴ F24H *3/06*
U.S. Cl. 237—7 **9 Claims**



1. A heat unit recycler for air in a room comprising:
an enclosed tank containing a liquid to be heated which liquid has an odor, said tank having a small air space and being enclosed such that the liquid remains in said tank at all times, said tank including a radiator-type pressure cap at a top of said tank for relieving excess pressure in said tank by the movement of air out of and into the air space in said tank;
a filter means for filtering any odor from the air passing outward from the air space in said tank through said pressure cap;
a heating means for heating all of the liquid in said tank;
a temperature control means for controlling said heating means to maintain the liquid in said tank at a predetermined value;
a plurality of heat exchange tubes passing through the liquid

in said tank, the interiors of said tubes being fluidly isolated from the liquid and each said tube having an inlet for room air and an outlet for heated air;

a fan means for drawing heated room air from said outlets of said tubes and for blowing the heated room air into the room;

a speed control means for turning on and off and controlling the rate of flow of air moved by said fan means;

a switch means for turning said heating means on and off; and

a base on which said tank, said heating means, said fan means, said speed control means, and said switch means are located.

4,705,214

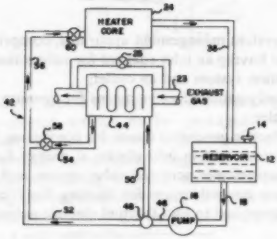
INDEPENDENT EXHAUST GAS HEAT SYSTEM

Roger L. Johnson, Fort Wayne, Ind., assignor to Navistar International Transportation Corp., Chicago, Ill.

Filed Jun. 4, 1985, Ser. No. 741,075

Int. Cl.[4] B60H *1/02*

U.S. Cl. 237—12.3 C **8 Claims**



1. An exhaust gas heat system for a vehicle passenger compartment comprising:

a surge reservoir supplying a liquid heat transfer medium to a pump means for circulating said liquid medium through said heat system;

an internal combustion engine propelling a vehicle and comprising an exhaust system;

said exhaust system being connected with a heat exchanger for heating siad liquid medium passing through said heat system and said exchanger;

a heater core disposed to heat the passenger compartment and located downstream of said pump means;

valve means regulating the flow of said liquid medium to said heater core depending on the temperature of said medium, said valve means maintaining said liquid medium below the boiling point;

said heat system being independent of any engine coolant fluid system.

4,705,215

ARRANGEMENT FOR SECURING RAILWAY RAILS ONTO SLEEPERS

Helmut Eisenberg, Werdohl; Henning von Heimburg, Lüdenscheid; Friedhelm Weber, Neuenrade; Achim Beste, and Dirk Vorderbrück, both of Werdohl, all of Fed. Rep. of Germany, assignors to Vossloh-Werke GmbH, Werdohl, Fed. Rep. of Germany

Filed Apr. 17, 1986, Ser. No. 853,021

Int. Cl.[4] E01B *9/00, 21/04*

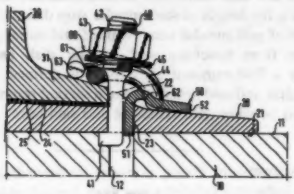
U.S. Cl. 238—349 **4 Claims**

1. Arrangement for securing railway rails to sleepers, in particular wooden sleepers, comprising

metal plates, each of which lies with its flat lower surface on a sleeper, on the upper surface of which plates are provided two ribs extending in the longitudinal direction of the rail, between which ribs the foot of the sleeper lies on a bearing surface, and which plates have on both sides of the rail in the region of each rib at least one through-hole, with which a respective through-hole in the sleeper is aligned;

screws, each having a diameter which is smaller than the diameter of the through-hole of the plate, each being inserted with its lower end into the respective through-hole of the plate and engaging with a hook-like portion beneath the lower surface of the plate, and each being provided on its upper end with a thread, with which a nut is engaged;

plate-like securing elements, each forming a double-armed angle member, each first arm, together with the associated screw, engaging in the corresponding through-hole in the plate and thus fixing the screw in this through-hole in such manner that the hook-like portion of the screw engages securely beneath the lower surface of the plate, and each



second arm extending perpendicularly away from the rail, and lying at least partially on the upper surface of the plate;

resilient clips, which are each associated with a respective screw, and each of which consists of a round-section steel rod, and has a form which is symmetrical to a vertical plane perpendicular to the rail, a central part partially surrounding the screw and lying beneath the nut, a part facing the rail lying on the rail foot, and a part facing away from the rail, pressing from above on the upper surface of the plate and

said resilient clips having bends adjoining said central part adapted to press on said plate and whereby said second arm of said plate-like securing elements lies between said bends of the clips and is adapted to prevent the clip from twisting during tightening.

4,705,216

FOUNTAIN MAINLY FOR INDOOR USE

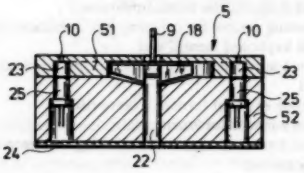
Karoly Kaffka, 20, Abel Jeno utca, 1113 Budapest; Tibor Lezak, 12, Kun utca, 1081 Budapest; György Striker, 23/a, Katona Jozsef utca, 1137 Budapest, all of Hungary, and Eva Zeisel, 600 W. 115th St., New York, N.Y. 10025

Filed Nov. 8, 1985, Ser. No. 796,579

Claims priority, application Hungary, Nov. 9, 1984, 4180/84

Int. Cl.[4] F21D *7/00;* B05B *17/08*

U.S. Cl. 239—18 **8 Claims**



8. A fountain mainly for indoor use, comprising a water container having an open water surface; a plurality of jets for discharging water; a motor; a centrifugal pump driven by said motor and connected to said jets, said motor having a central

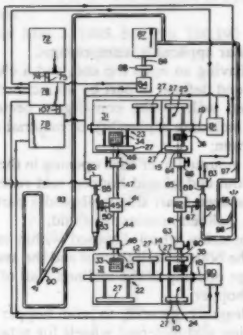
axis and being positioned above said open surface so that said central axis is vertical, said pump including a paddle-wheel, said pump being coaxially connected to said motor and positioned below a maximal nominal water level in said container, said pump having a suction stub extending downwardly near a bottom of said container; and a plurality of light-emitting semi-conductors mounted on said pump so to as illuminate said jets.

4,705,217

MATERIAL MIXING AND SPRAYING APPARATUS

David H. Hartley, P.O. Box 11 Mill Cir., and Dick Sellers, Valley View Trailer Park Lot 28, both of Byron, Ga. 31008

Filed Oct. 28, 1986, Ser. No. 923,962
Int. Cl.[4] B67D 5/52
U.S. Cl. 239—142 9 Claims



1. Mix and spray apparatus for mixing and spraying materials for ceilings and walls and the like, said apparatus comprising:

a first tank;

first mixing element for mixing materials placed in said first tank;

first drive shaft connected to said first mixing element for driving said first mixing element;

first hydraulic motor mounted in direct drive relationship with said first drive shaft for turning said first drive shaft and thus driving said first mixing element;

first tank outlet from which material is removed from said first tank;

a second tank;

second mixing element for mixing materials placed in said second tank;

second drive shaft connected to said second mixing element for driving said second mixing element;

second hydraulic motor mounted in direct drive relationship with said second drive shaft for turning said second drive shaft and thus driving said second mixing element;

second tank outlet from which material is removed from said second tank;

common material exhaust assembly for receiving material from both said first tank outlet and said second tank outlet, said common material exhaust assembly comprising a first materials moving pump, third hydraulic motor for driving said first materials moving pump and flow selecting means for selectively opening flow communication between said first tank outlet and said first materials moving pump and between said second tank outlet and said first materials moving pump; and

first common spray means for receiving materials from said first materials moving pump and discharging said materials,

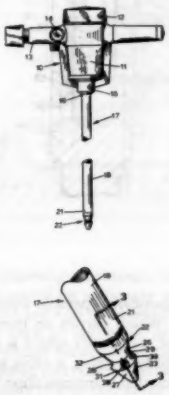
whereby a continuous operation of materials spraying is maintained through a single, common spray means by mixing materials in the first tank while exhausting materials from the second tank and then mixing materials in the second tank while exhausting materials from the first tank, and selectively exhausting each tank throughthe common exhaust assembly to the common spray means.

4,705,218

NOZZLE STRUCTURE FOR A ROOT FEEDING DEVICE

Jay S. Daniels, Des Moines, Iowa, assignor to Ross Daniels, Inc., Des Moines, Iowa

Continuation of Ser. No. 722,599, Apr. 12, 1985, abandoned.
This application Jun. 9, 1986, Ser. No. 871,687
Int. Cl.[4] B05B 1/14
U.S. Cl. 239—271 1 Claim



1. A nozzle structure for a root feeding device having a cartridge receiving chamber means with a fluid outlet and a fluid inlet for receiving fluid under pressure, said nozzle structure comprising:

(a) a soil penetrating tube connected at one end to said outlet;

(b) a nozzle unit having a first portion positioned within and secured to the opposite end of said tube, and a second portion confined within the transverse cross sectional area of the tube and projected outwardly from said opposite end of the tube;

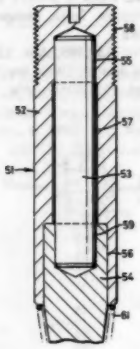
(c) said second portion comprising a coaxially aligned outer cone section having a base portion and a tip portion, and inner frustum cone section including a base end in abutting engagement with said opposite end of the tube and an intermediate annulus section with a peripheral surface reversely inclined relative to the peripheral surface of each of said inner and outer cone sections, said nozzle unit having an axial bore extended there through and said intermediate section a plurality of radial fluid discharge passage means in fluid registration with said axial bore, with said base end having a diameter substantially equal to the outer diameter of said tube and greater than the diameter of the base portion of said outer cone section, and

(d) said axial bore having an outlet in said tip portion, said outlet being formed in a tapered portion of said axial bore and being of reduced diameter with respect to said bore and each of said radial passage means having an outlet in the intermediate section with a diameter greater than the diameter of the outlet of said axial bore.

4,705,219
ELECTROMAGNETICALLY-OPERABLE FLUID INJECTORS

Brian C. Pagdin, Dunstable, England, assignor to Solex (UK) Limited, England

Filed Sep. 23, 1985, Ser. No. 778,961
Int. Cl.[4] F02M 51/08
U.S. Cl. 239—397.5 8 Claims



1. An electromagnetically-operable fluid injector comprising a hollow body which carries an injector nozzle which forms a nozzle orfice, a chamber which is formed by the hollow interior of the body, a valve, a valve seat with which the value cooperates such that communication between the chamber and the nozzle orifice is allowed when the valve is unseated and is blocked when the valve is seated, a solenoid core which projects into the chamber opposite the valve seat, and a solenoid winding wound around the core, the valve being located in a gap in a magnetic circuit which is formed by the body, including the core, and which is magnetized by energization of the solenoid winding, wherein means which respond to changes in temperature to which they are subjected by changing a physical characteristic thereof, are provided in the injector so that they cooperate with one of the valve and the valve seat such that any tendency for fluid flow metering characteristics of the injector to be changed by a change in the temperature in the injector is countered whereby operation of the injector to inject fluid is substantially independent of temperature change;

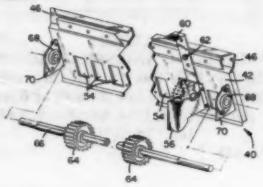
wherein the stroke of movement of the valve relative to the valve seat is changed with a change in temperature by virtue of a consequent change in the physical form of said means which causes a change in the distance between the solenoid core and the valve seat; and

wherein such variation in the stroke of the valve is achieved by the use of a telescopic assembly as the solenoid core, one part of the solenoid core nearer to the valve seat, being guided for rectilinear movement towards and away from the valve seat by a static part of the solenoid core, which is mounted in the hoolow body, and being connected to the static part by a connecting piece of a material having a different coefficient of expansion from that of the material from which the static part is formed such that said one part is caused to move relative to said static part by the effects of the differential expansion of the connecting piece relative to the static part.

4,705,220
GRANULAR APPLICATOR WITH INTERCHANGEABLE METERING WHEELS

Dale E. Gandrud, and Ebenhard S. Gandrud, both of Owatonna, Minn., assignors to Gandy Company, Owatonna, Minn.

Filed Nov. 25, 1985, Ser. No. 801,489
Int. Cl.[4] A01C 7/12
U.S. Cl. 239—654 19 Claims



1. A granular applicator, comprising:

a hopper having an open top end, and a closed convergent bottom end defined in part by an inclined wall;

the inclined wall of the convergent bottom end of said hopper including a plurality of material discharge openings therein;

a receiver mounted over each opening in the inclined wall of the bottom end of said hopper, said receiver including a pair of spaced-apart side walls and a partial bottom wall with an inclined terminal free end;

a fluted metering wheel disposed within each receiver between the bottom wall thereof and the associated material discharge opening in the inclined wall of the bottom end of said hopper;

means releasably secured to said hopper for commonly supporting said metering wheels for rotation;

a slideable gate plate mounted for movement between open and closed positions between each metering wheel and the associated material discharge opening;

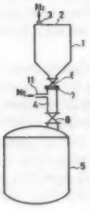
means for effecting rotation of said metering wheels to feed material between said wheel and the bottom walls of said receivers; and

means associated with said receiver for receiving and distributing the material for application.

4,705,221
QUANTITATIVE CONTINUOUS FEEDING METHOD FOR IODINE

Muneo Isayama, Oami-shirasato, and Shoichi Midorikawa, Shirako, both of Japan, assignors to Ise Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1986, Ser. No. 896,236
Claims priority, application Japan, Aug. 14, 1985, 60-177594
Int. Cl.[4] B02C 13/00
U.S. Cl. 241—27 8 Claims



4. An apparatus for the quantitative continuous feeding of globular iodine, comprising:

a sealable hopper;

a reactor;

a connecting means for sealable connecting said hopper and said reactor;

a meter for quantitatively metering said globular iodine in said connecting means;

a source of nitrogen gas; and

a nitrogen gas inlet tube connected to said source, and integral with said connecting means and opening into said connecting means, whereby nitrogen gas flows in a direction opposite to the direction of said feeding of said iodine.

4,705,222

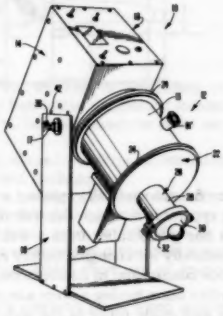
MULTIPURPOSE MIXER

Albert J. Shobet, Forest Park, Ohio, assignor to Processall, Inc., Cincinatti, Ohio

Filed May 3, 1985, Ser. No. 730,190

Int. Cl.[4] B02C *23/08*

U.S. Cl. 241—69 27 Claims



1. A multipurpose mixer comprising:

(a) a drum having first and second ends, the first end of the drum being closed during mixing operation and being openable from its closed position for permitting access to the interior of the drum to permit replacement of mixing elements mounted on a first drive shaft contained within the drum, the elements being designed for performing particular types of mixing operations when the drum is disposed at particular angular orientation including the performing of at least one type of mixing operation with the first drive shaft disposed at a horizontal orientation and at least one other type of mixing operation with the first drive shaft disposed in a vertical orientation, the first end of the drum having a port with a closure which is openable from a closed position used during operation to permit the addition of materials into the drum and the removal of materials from the drum;

(b) the first drive shaft being disposed axially within the drum, rotatably supported in the second end of the drum, and having an extension through the second end for attachment to a motor to rotate the drive shaft;

(c) a motor coupled to the extension of the drive shaft for rotating the drive shaft;

(d) means for pivoting the drum around an axis of rotation through a range of annular orientations, the axis of rotation being orthogonal to the first shaft; and

(e) means for positioning the drum in any one of a plurality of angular orientations, the means for positioning permitting the selective positioning of the drum in angular orientations which position the first drive shaft in at least a horizontal and in a vertical orientation.

4,705,223

BOWL MILL

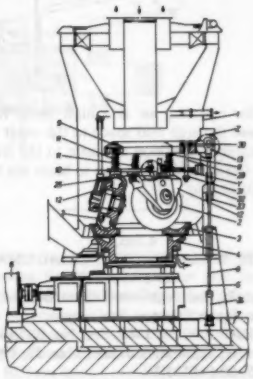
Günter Dibowski, Essen, and Helmut Grommes, Duisburg, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Nov. 15, 1985, Ser. No. 798,480

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 3443716

Int. Cl.[4] B02C *4/02, 15/04*

U.S. Cl. 241—117 11 Claims



1. A bowl mill comprising: a housing; a rotatable bowl; three rollers rotatably mounted on stationary axles and rolling on said bowl; said rollers and said bowl being surrounded by said housing; a rotating track on said bowl; an upper frame and a lower frame with springs between said upper frame and said lower frame for holding said rollers against said rotating track on said bowl; a plurality of rods connected to said upper frame; a hydraulic cylinder connected to each one of said plurality of rods, each one of said rods connected to said hydraulic cylinder extending out of said housing and toward said upper frame; a piston associated with said hydraulic cylinder being chargeable at either end; hinges for attaching said rollers to said lower frame, said rollers having an angle of inclination; angle-setting means for setting said angle of inclination; and tension means connecting said frames for limiting expansion of said springs, ball joints for connecting said rods to said upper frame.

4,705,224

APPARATUS FOR BLOWING A THREAD END OFF OF A FULL CHEESE FORMED BY AN OPEN-END SPINNING AND WINDING MACHINE

Shigeo Akiyama, Nishinomiya, and Shigeji Satou, Okayama, both of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Okayama, Japan

Filed Oct. 14, 1986, Ser. No. 918,104

Claims priority, application Japan, Oct. 14, 1985, 60-229378

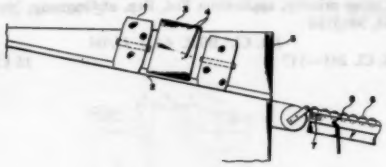
Int. Cl.[4] B65H *54/22, 67/06*

U.S. Cl. 242—35.6 E 4 Claims

1. An apparatus for blowing a thread end off of a full cheese on which the thread is disposed in a winding direction as the full cheese is discharged in a transport direction along a transport path defined on an open-end spinning and winding machine which has formed the full cheese, said apparatus comprising:

a pipe conduit disposed in the transport path and through which the full cheese passes, said pipe conduit having an inner diameter that is larger than the outer diameter of the full cheese for allowing the full cheese to pass therethrough with a space defined therebetween, said pipe conduit having an entrance side through which the full

cheese enters when passing therethrough and an exit side through which the full cheese exits after passing therethrough, and said pipe conduit having a plurality of nozzles disposed at said exit side and open at the inner surface



thereof for injecting air at a high speed from the inner surface and through said space to the outer surface of the full cheese in a direction opposite to the transport direction and the winding direction to blow the thread end off of the full cheese.

4,705,225

AUTOMATIC WRAPPING MATERIAL CHANGE-OVER APPARATUS

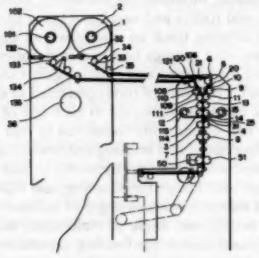
Masaru Miyazaki, and Toshihide Kohata, both of Tokyo, Japan, assignors to Japan Tobacco, Inc., Japan

Filed Feb. 26, 1986, Ser. No. 833,581

Claims priority, application Japan, Mar. 29, 1985, 60-063229; Mar. 29, 1985, 60-045135[U]

Int. Cl.[4] B65H *19/20, 19/26*

U.S. Cl. 242—56 R **16 Claims**



1. An automatic wrapping material change-over apparatus comprising

first and second bobbins wound respectively with first and second wrapping materials, and means for mounting said first and second bobbins arranged opposite each other;

feed roller means for drawing out said first wrapping material from the first bobbin;

first and second take-up roller means provided between said first and second bobbins and said feed roller means symmetrically with respect to the drawn out first wrapping material, said second wrapping material being adapted to be taken up onto the second take-up roller means; and

change-over knife means provided upstream of each of said first and second take-up roller means at a predetermined distance therefrom for simultaneously cutting said first and second wrapping materials generally along a single line extending generally perpendicular to the direction of travel of said first and second materials to produce a free wrapping material cut off from said first wrapping material and a discard leading portion from said second wrapping material taken up on the take-up roller means, a fresh cut leading end of the second wrapping material thereby closely following a fresh cut trailing end of the first wrapping material.

4,705,226

DEVICE FOR AUTOMATICALLY SPLICING A WEB OF MATERIAL IN A WEB FEEDING APPARATUS

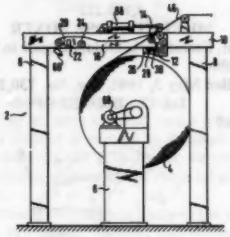
Willi Goetz, Seeheim, Fed. Rep. of Germany, assignor to Valmet-Strecker GmbH, Pfungstadt, Fed. Rep. of Germany

Filed Jan. 15, 1987, Ser. No. 3,502

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1986, 3601296

Int. Cl.[4] B65H *19/29, 19/08*

U.S. Cl. 242—56 R **11 Claims**



1. A device for automatically splicing a web of material in web feeding apparatus in which the web of material is drawn over at least one guide roller from a web supply roll and is stopped periodically for changing supply rolls, said automatic splicing device comprising, in combination:

(a) an arm-like beam having a pivot axis at one end disposed adjacent said guide roller of the web feeding apparatus, said beam being arranged to swing about said pivot axis toward and away from the outer circumference of said supply roll, the swinging movement of said beam being limited such that it can approach the core of said supply roll only up to a certain minimum distance therefrom;

(b) a severing knife, at least one suction means and a pressure-applying means disposed successively from the opposite end of said arm-like beam and extending over substantially the entire width of the web of material, said pressure applying means being capable, until the movement of said beam is limited, of coming resiliently into engagement with the circumferential surface of said roll;

(c) a pulley member and a counter member for said severing knife, disposed on said beam and arranged to travel automatically on said beam perpendicular to said pivot axis, said pulley member and said counter member likewise occupying substantially the entire width of the web of material;

(d) means for controlling the swinging movement of said beam and the movement of said pulley member with said counter-member on said beam such that, (1) with the outrunning web stopped, said beam swings toward the supply roll, said pulley member guides the web in front of said suction member, and said counter-member comes against the severing knife to sever the web; (2) whereupon said beam swings back to its starting position and said pulley member with said counter-member also returns to its starting position; whereupon (3) after a new web supply roll has been installed on the feeding apparatus, said beam swings against the new roll so that said pressure-applying means rests against the circumferential surface of the roll; and, ultimately, (4) said beam swings back again to its starting position.

4,705,227

APPARATUS FOR WINDING-UP AND UNWINDING CONTINUOUSLY ARRIVING FLEXIBLE FLAT STRUCTURES

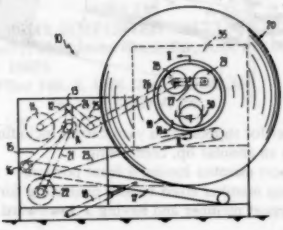
Werner Honegger, Tann Rüti, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Apr. 6, 1987, Ser. No. 34,622

Claims priority, application Switzerland, Apr. 14, 1986, 1475/86

Int. Cl.[4] B65H *75/00, 18/02, 18/04*

U.S. Cl. 242—59 **13 Claims**



1. An apparatus for winding or unwinding continuously arriving, particularly imbricated flexible flat structures, preferably printed products, into a package or from such package, comprising:

a substantially ring-shaped winding core intended to support thereon the wound package;

said winding core having oppositely situated ends and a substantially cylindrical inner surface;

driven support wheels upon which there is frictionally mountable at the substantially cylindrical inner surface the winding core from which there can be de-mounted such winding core;

a substantially freely rotatable guide wheel arranged beneath said support wheels and capable of being brought into operative association with the substantially cylindrical inner surface of the mounted winding core and being raisable away from the substantially cylindrical inner surface of said mounted winding core;

means defining a deflection axis which is substantially radially directed with respect to the mounted winding core and cooperating with said guide wheel;

said guide wheel being deflectable about said substantially radially directed deflection axis in an operative position of said guide wheel; and

impact means cooperating with one end of the oppositely situated ends of the winding core.

4,705,228

SPINNING REEL HAVING IMPROVED BAIL ARM MECHANISM

Kenji Maruyama, and Takehiro Kobayashi, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Oct. 28, 1985, Ser. No. 791,810

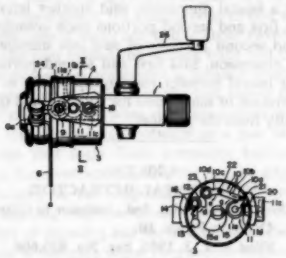
Claims priority, application Japan, Oct. 26, 1984, 59-162696[U]; Oct. 31, 1984, 59-166137[U]; Oct. 31, 1984, 59-166138[U]

Int. Cl.[4] A01K *89/01*

U.S. Cl. 242—84.2 G **6 Claims**

1. A bail arm changeover mechanism for a spinning type fishing reel comprising:

a bail arm (**6**); a pair of opposed arms (**4, 5**) pivotally supporting said bail arm; a rotor (**3**) securing the pair of opposed arms and bail arm such that the bail arm automatically returns from a line-releasing position to a line-rewinding position upon rotation of the rotor, a bail arm lever (**7**) mounted on one of said arms; a bail arm cam (**8**) mounted opposite the bail arm lever on another one of said arms; a gear transmitting mechanism (**11**) connected with the bail arm lever; a link mechanism (**10**) disposed completely within the rotor and connected with the gear transmitting mechanism, said link mechanism having a plurality of links (**10***b*, **10***c*); a follower gear (**12**) supported by the rotor and connected with the link mechanism; a spring (**14**) biasing the follower gear towards a line-releasing position; a pin (**13**) provided on the following gear; a bail



arm changeover cam (**15**) fixedly attached in a reel body (**1**) and forcing the pin and follower gear in a direction opposed by the spring when the rotor is rotated when the bail arm is in the line-releasing position, whereby the bail arm lever rotating opposite the line-releasing position moves the link mechanism into a dead point where the links (**10***b*, **10***c*) are linearly aligned, and permits the spring to bias the follower gear into a line-releasing position.

4,705,229

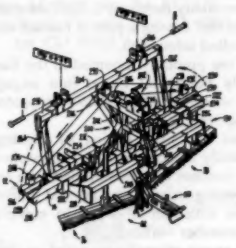
COMPACT APPARATUS FOR LAYING PAVING FABRIC

Mounque Barazone, P.O. Box 5217, Cottonwood, Calif. 96022

Continuation-in-part of Ser. No. 542,475, Oct. 17, 1985, abandoned. This application Aug. 27, 1985, Ser. No. 769,677

Int. Cl.[4] B65H *16/00;* **E01C** *3/00, 11/16*

U.S. Cl. 242—86.52 **4 Claims**



1. A vehicle mounted apparatus for laying paving fabric from a roll on a surface comprising:

a. one member having a lateral dimension, said member including a first portion and a second portion;

b. means for supporting the roll from said one member, for permitting the roll to unwind with vehicle movement and for laying the fabric over the surface, said means for supporting the roll from said one member including a pair of arms appending from said one member, each of said arms engaging opposite ends of fabric roll;

c. a frame including means for attaching said frame to the vehicle, said first and second portions of said one member being pivotally attached to said frame;

d. means for rotating said first and second portions of said one member upwardly from the surface including:

a winch mounted on said frame;

a first pulley mounted on said frame;

a second pulley mounted on said one member first portion;

a third pulley mounted on said one member second portion; and

a winch cable capable of being wound and unwound from said winch, said winch cable passing around said first, second, and third pulleys and being fixed to said frame thereafter.

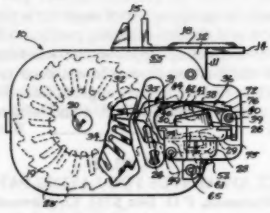
e. another lateral member distinct from said one member having a lateral dimension, said another lateral member having first and second portions each connected to said first and second portions of said one member having a lateral dimension, said first and second portions of said another lateral member rotating upwardly as a result of the operation of said means for rotating said one member upwardly from the surface.

4,705,230

HORIZONTAL RETRACTOR

Gerald A. Doty, Crown Point, Ind., assignor to Gateway Industries, Inc., Olympia Fields, Ill.

Filed Mar. 3, 1986, Ser. No. 835,606
Int. Cl.[4] B60R *22/40*
U.S. Cl. 242—107.4 A **9 Claims**



1. In a horizontally mounted retractor, a horizontally elongated frame having a pair of substantially parallel side walls extending horizontally and elongated in the horizontal direction, a reel rotatably mounted in the frame side walls adjacent a first end thereof having a pair of ratchet wheels thereon and carrying a rolled safety belt,

a locking bar pivotally mounted in the frame side walls for generally horizontal travel into engagement with the ratchet wheels on the reel to stop protraction of the belt from the reel,

one of said side walls having an opening therein located horizontally adjacent one of said ratchet wheels,

an inertia member mounted in the frame and projecting into said opening in said one of said frame side walls, and movable with inertia forces to move a portion of the inertia member vertically,

a transfer means pivotally mounted on the frame to engage the inertia member and to be pivoted by vertical displacement of the inertia member as it pivots with a portion thereof pivoting in said opening of said one of said frame side walls,

a programmed ratchet mounted for rotation about the reel axis.

a programmed pawl pivotally mounted for movement into and out of engagement with the programmed ratchet, a first portion on the programmed pawl engageable with the transfer means for displacement with pivotable movement of the transfer means to pivot the programmed pawl into engagement with the programmed ratchet whereby the programmed ratchet further rotates the programmed pawl about its mounting, and

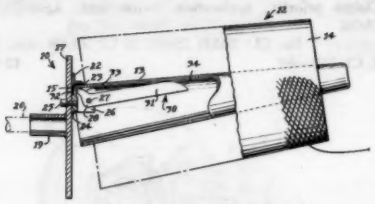
means on the programmed pawl for pivoting the locking bar for generally horizontal travel into locking engagement with the ratchet wheels when displaced by the programmed ratchet.

4,705,231

YARN CARRIER HOLDER

Jerry T. Green, Hixson, Tenn., assignor to Tuftco Corporation, Chattanooga, Tenn.

Filed Apr. 15, 1987, Ser. No. 38,754
Int. Cl.[4] B65H *49/04, 49/36*
U.S. Cl. 242—130 **7 Claims**



1. A holder for supporting a yarn carrier including a hollow core having an annular lip, comprising:

(a) a support member having a front portion,

(b) a clamp member fixed to and projecting forward from said support member and having a downward facing jaw surface,

(c) a bell crank member having a journal portion, a movable clamp member projecting from said journal portion, and an elongated lever arm projecting from said journal portion at an angle to said movable clamp member,

(d) bracket means fixed to said support member,

(e) journal means pivotally connecting said journal portion to said bracket means for pivotal movement about a transverse pivotal axis, said lever arm extending freely forward of said support member and said movable clamp member projecting upward toward said jaw surface, so that the weight of said lever arm normally pivots said movable clamp member upward toward clamping engagement with said fixed jaw surface,

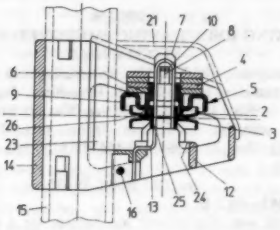
(f) said lever arm engaging the upper, inner surface of the hollow core of a yarn carrier when the lip of the core is inserted between said clamp members.

4,705,232

YARN TENSIONING DEVICE

Erwin Bossart, Flawil, and Hans Hasler, Uzwil, both of Switzerland, assignors to Benninger AG, Uzwil, Switzerland

Filed Feb. 26, 1987, Ser. No. 19,174
Claims priority, application Switzerland, Mar. 5, 1986, 900/86
Int. Cl.[4] B65H *59/22*
U.S. Cl. 242—150 R **11 Claims**



1. A yarn tensioning device comprising a hollow housing, opposed separated yarn guides for guiding substantially horizontally yarn when passing through said housing, a lower brake plate support fixed in said housing for supporting a lower brake plate below and in contact with yarn when passed between said yarn guides, a lower brake plate mounted on said lower brake plate support, vertical guide means interposed

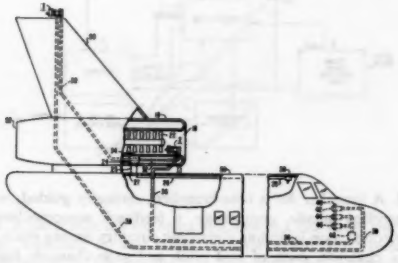
between said yarn guides, an upper brake plate formed with an aperture for the passage therethrough of said guide means, said guide means and said upper brake plate being located for said upper brake plate to press yarn against said lower brake plate when yarn is passing between said yarn guides, a guide plate mounted for vertical reciprocation on said guide means and bearing on said upper brake plate, weighting disks stacked on said guide plate, and means for centering said weighting disks on said guide plate, whereby the weight of said disks determines the pressure of said upper and lower brake plates on the yarn when passing between said yarn guides.

4,705,233

TRUSTWORTHY SIMPLIFIED VACUUM SYSTEMS

Richard D. Henry, Hookstown Grade Rd., R.D. #1, Box 331-A, Clinton, Pa. 15026

Filed Feb. 5, 1986, Ser. No. 826,330
Int. Cl.[4] B64D *41/00*
U.S. Cl. 244—1 R **3 Claims**



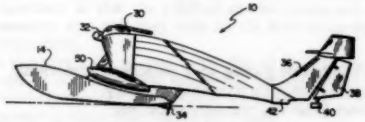
1. A vacuum system apparatus for an aircraft comprising of a de-iced or anti-iced venturi, said venturi located within the inlet throat of a turbo-jet engine, apparatus further comprising a pressure regulator and connective tubing connecting said vacuum system to a gyro system onboard the aircraft to provide regulated vacuum pressure for the gyro systems of the aircraft, said vacuum pressure available by means of air being drawn thru said venturi immediately following engine start up due to extreme draw force of the compressor section of said turbo-jet engine, likewise, said vacuum pressure receives additional boost due to extreme low pressure indigenous to the location of said venturi within said inlet throat of said turbo-jet engine and further vacuum boost will be available as the aircraft increases its speed during flight due to increase airflow thru said venturi.

4,705,234

RAM WING SURFACE EFFECT VEHICLE

Ronald L. Bourn, 780 Beejay Dr., San Diego, Calif. 92154

Filed Apr. 10, 1985, Ser. No. 722,124
Int. Cl.[4] B64C *35/02*
U.S. Cl. 244—12.1 **7 Claims**



1. A surface effect vehicle for operation predominately within the region of ground effect, comprising:

an aero-hydrodynamic hull having a longitudinal axis, a hydrodynamic under surface and an aerodynamic lift upper surface;

said hull having a lower portion having generally parallel sides, an upper surface that is cambered both laterally and longitudinally and extending over the parallel sides forming a continuous curve from the stern to the forward end;

an aerodynamic wing structure secured to and disposed a predetermined distance above said hull with the axis thereof extending generally transverse to said longitudinal axis, wherein the lift surfaces and center of lift of said hull and said wing are coupled and positioned relative to one another for achieving aerodynamic stability within the region of ground effect, the leading edge of said wings are spaced a distance of about one-half to about two-thirds the length of the hull behind the leading edge and the lower surface of said wings are spaced a distance of about one-third to one-half the length of the hull above the upper surface of said hull, said wing structure curves downward from the longitudinal axis outward to a pair of straight parallel tips that form floats extending backward and upward to form vertical tail fins, the trailing edge of said airfoil dividing at the longitudinal axis separating into outward tapering edges to the aft end;

the chord line of the wing and the chord line of the hull are at an angle of between about two and six degrees to one another with the trailing edges diverging;

a pair of elevons mounted between said tail fins;

operator compartment means disposed on one of said hull and said wing structure for containing an operator and controls for said vehicle;

propulsion means mounted on said hull and positioned to provide a thrust along said longitudinal axis; and

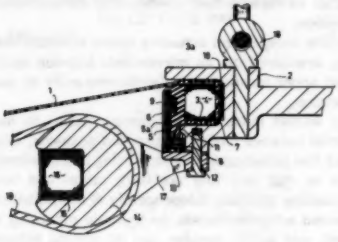
control means manipulable from said operator's compartment for controlling said vehicle.

4,705,235

METHOD AND A DEVICE FOR HOOKING A BALLOON ENVELOPE TO A FASTENER MEANS

Robert Regipa, Toulouse, France, assignor to Centre National d'Etudes Spatiales (C.N.E.S.), Paris, France

Filed Apr. 14, 1986, Ser. No. 852,024
Claims priority, application France, Apr. 12, 1985, 85 05674
Int. Cl.[4] B64B *1/40*
U.S. Cl. 244—31 **16 Claims**



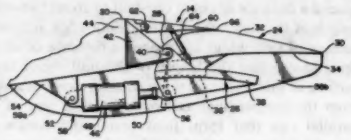
11. A fastener for attaching to an envelope (1) made of a flexible sheath comprising an annular fixation part (2) made of a rigid material and with an outer peripheral side having an annular groove (3) for acting as a housing for locking the sheath, a tightening collar (4) to tighten the sheath and located in the annular groove (3) formed by a cable made of a substantially inextensible material of high tensile strength wound inside and to a specific depth of the said groove, an annular seal (5) located in said groove around said outer peripheral side (4a) of said tightening collar (4), and a retaining strap (6) made of a substantially inextensible material of high tensile strength and wound around said annular seal (5).

4,705,236

AILERON SYSTEM FOR AIRCRAFT AND METHOD OF OPERATING THE SAME

Peter K. C. Rudolph, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1981, Ser. No. 306,651
Int. Cl.[4] B64C 9/04
U.S. Cl. 244—90 R 17 Claims



14. In an aileron system for a wing of an airplane, said system being adapted for roll control at both high and low speeds, wherein said system comprises two aileron assemblies, positioned at opposite sides of said wing at respective aileron locations, each assembly comprising:

(a) a mounting structure mounted at the rear end of the wing at its related aileron location for up and down rotation about an axis generally aligned with a spanwise axis of the wing;

(b) an aileron airfoil member having a leading edge, a trailing edge, an upper aerodynamic surface and a lower aerodynamic surface, said airfoil member being movably mounted to said mounting structure for movement between a stowed first position where the upper and lower airfoil surfaces aerodynamically match the upper and lower wing surfaces for roll control for high speed flight, and to an extended high lift second position where the airfoil member forms a slot with a trailing edge of the wing, said airfoil member and said mounting structure being arranged in its assembly in a manner that said mounting structure with the airfoil member can be rotated to upper and lower locations, with the airfoil member in either its stowed first position and its extended second position;

(c) a first independent actuating means to rotate the mounting structure from an intermediate location upwardly to said upper location and also downwardly to said lower location,

(d) a second independent actuating means to move said airfoil between its first and second positions, said second and first actuating means each being independently operable so that said first actuating means can rotate said mounting structure independently of any actuation of said second actuating means, so that said mounting structure with said airfoil member can be rotated betweeen said upper and lower locations, with said airfoil member remaining in either its first or second position.

a method of operating said system, said method comprising:

(a) for high speed operation, causing the second actuating means to move the airfoil members to the first position and then operating the first actuating means of the two assemblies oppositely to create roll moments for aircraft control;

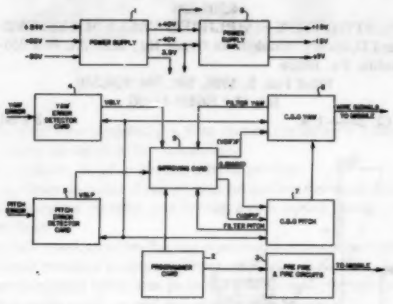
(b) for low speed operation, causing the second actuating means to move the airfoil members to the second position and then operating the first actuating means of the two assemblies oppositely to create roll moments for aircraft control.

4,705,237

LAUNCHER FOR AN OPTICALLY GUIDED, WIRE-CONTROLLED MISSILE WITH IMPROVED ELECTRONIC CIRCUITRY

Emil Goldfeld; Shlomo Harush, both of Holon; Yuri Takserman, Netanya, and Shmuel Weiler, Herzlia, all of Israel, assignors to The State of Israel, Ministry of Defence, Israel Military Industries, Israel

Filed Oct. 16, 1986, Ser. No. 919,666
Claims priority, application Israel, May 12, 1986, 78757
Int. Cl.[4] F41G 7/32
U.S. Cl. 244—3.12 4 Claims



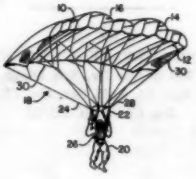
1. A launcher for a tube-launched, optically guided, wire-controlled missile, comprising: a feedback servomechanism controlled loop including electronic circuitry having pitch and yaw channels, each of said pitch and yaw channels having respective time variable gain circuit means for acting on a respective one of pitch and yaw error signals in accordance with a respective transfer function, and wherein said transfer function of said time variable gain circuit of said pitch channel is different from said transfer function of said time variable gain circuit of said yaw channel.

4,705,238

RAM AIR PARACHUTE WITH MULTIPLE PRESSURE CENTERS

William L. B. Gargano, 1516 Drexel Dr., Davis, Calif. 95616

Filed Jul. 8, 1986, Ser. No. 883,091
Int. Cl.[4] B64D 17/02
U.S. Cl. 244—145 20 Claims



1. An inflatable gliding wing parachute, comprising:

an upper, generally rectangular canopy;

a lower, generally rectangular canopy;

a plurality of airfoil shaped ribs connecting the upper and lower canopies to define a plurality of longitudinally extending air flow chambers;

a plurality of suspension lines having their upper ends attached to corresponding ones of the ribs and being arranged in longitudinally spaced and transversely extending rows, the suspension lines being dimensioned and attached to preselected ones of the ribs at preselected trim

angles to define at least two cells each made of three adjacent chambers with suspension lines connected only to the outermost ribs thereof, and at least one remaining cell made of two adjacent chambers with suspension lines connected only to the outermost ribs thereof;

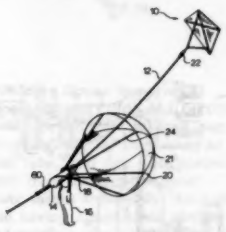
whereby the parachute, when inflated during flight, will have at least two transversely spaced centers of air pressure.

4,705,239

TOY PARACHUTE

Eric A. Baird, 137 Sixth St. Rm 2, New Toronto, Canada M8V 3A6

Filed Aug. 18, 1986, Ser. No. 897,269
Int. Cl.[4] B64C *31/06*
U.S. Cl. 244—155 R **10 Claims**



1. A parachute toy for being attached to a kite string and for, after travelling up said string with the wind, being released from said string for free flight to the ground, said toy comprising:

weight means,

a parachute having a canopy and a plurality of shroud lines, said shroud lines being separately attached to said canopy at their upper ends and attached to said wieght means at their lower ends,

carrier means having an elongate opening centrally therethrough to receive said kite string therein so that the carrier means is slidable up and down the kite string,

the carrier means having at an upper end thereof external frusto-conical engagement surfaces disposed substantially coaxially about the opening and tapering towards the upper end,

the weight means including a split sleeve member coupled thereto with an aperature centrally through the split sleeve member open at an upper end and at a lower end, a major slot through the sleeve member opening into the aperature throughout its length from said upper end to the lower end, internal frusto-conical engagement surfaces on the split sleeve member defining said aperature tapering toward the upper end complimentary to the external frusto-conical engagement surfaces on the carrier means,

the split sleeve member adapted to releasably couple to the carrier means coaxially thereabout by insertion of the upper end of the carrier means into the lower end of the aperature so that the coupled carrier means and sleeve member as a unit may slide on the kite string disposed thereabout,

the slot permitting passage of the kite string into the aperature on coupling of the split sleeve member to the carrier means and out of the aperature on uncoupling of the split sleeve member from the carrier means,

stop means for attachment to the kite string at a desired height above the carrier means and sized to arrest upward movement of the carrier means yet permit upward movement of the split sleeve member therepast,

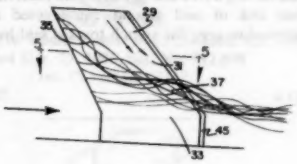
the split sleeve member being releasably coupled to the carrier means by a frictional engagement between the outer engagement surfaces of the carrier means and internal engagement surfaces of the split sleeve member, said frictional engagement being sufficient to withstand wind forces acting on the parachute while the parachute is drawing the carrier means and weight means upwardly on the kite string but insufficient to hold the split sleeve member on the carrier means when the carrier means is arrested from further upward movement along the kite string by the stop means.

4,705,240

PASSIVE VORTEX LIFT CONTROL

Charles J. Dixon, 3261 Hickory Crest Dr., Marietta, Ga. 30064

Filed May 14, 1984, Ser. No. 610,094
Int. Cl.[4] B64C *23/06*
U.S. Cl. 244—199 **15 Claims**



1. A high-lift lifting surface for establishing and controlling vortex lift, said lifting surface comprising:

(a) an outboard panel having a leading edge that is swept forward, said panel being adapted to induce edge air flow separation at angles of attack prior to stall while maintaining attached trailing edge flow;

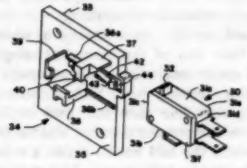
(b) an inboard panel adapted to maintain attached air flow; whereby the attached flow on said inboard panel creates a pressure sink for passively inducing axial air flow along the span of the outboard panel moving inboard, such axial flow serving to organize and stabilize the leading edge air flow separation into a leading edge vortex.

4,705,241

SWITCH MOUNTING DEVICE

Ando Sadao, Chigasaki, and Saito Satoshi, Kamakura, both of Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1986, Ser. No. 939,329
Int. Cl.[4] G12B *9/00*
U.S. Cl. 248—27.3 **3 Claims**



1. A switch mounting device for a switch with a case having top and bottom walls, first and second opposing side walls and third and fourth opposing side walls transverse to the first and second side walls, and a plunger extending through the first side wall, the mounting device comprising:

a base;

first and second rails formed on said base at a predetermined spacing, said rails defining a channel adapted to receive a switch positioned with the bottom wall of the switch case proximate said base and the first and second side walls of the case adjacent said first and second rails respectively;

a receiving member formed on said base, said receiving

member being located and configured for abutment with the third side wall of the switch case when the switch is positioned between said rails;

lugs formed on each of said rails and said receiving member and loated to engage the top wall of the switch case when the switch is positioned between said rails so as to hold the switch proximate said base;

a first resilient cantilevered member formed in said base and having a free end extending away from said receiving member and inclined away from said base so as to urge the switch toward said lugs, the free end of said first cantilevered member having a projection thereon adapted to engage the fourth side wall of the switch case; and

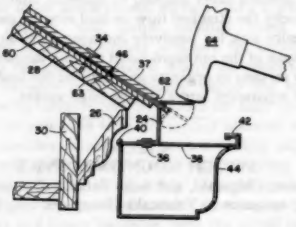
a second resilient cantilevered member formed in said base and having a free end adjacent said receiving member, the free end of said second cantilevered member being adapted to urge the switch toward said lugs.

4,705,242

UNIVERSAL GUTTER MOUNTING SYSTEM

George P. Yost, 102 Oswegatchie Rd., Waterford, Conn. 06385

Filed Apr. 22, 1987, Ser. No. 41,060
Int. Cl.[4] E04D *13/06*
U.S. Cl. 248—48.1 10 Claims



5. A universal system for attaching gutters to a building adjacent the eaves thereof, in those instances in which an elongated support strap extends upwardly from the gutter structure, the combination comprising:

an elongated anchor plate having a width substantially greater than that of the elongated strap and including integral major and minor pad members in contiguous relationship, having been folded about a transversely extending fold line such that said major pad member overlies said minor pad member, and having an elongated slot adjacent the fold line to define a mounting strip between the slot and the fold line, said anchor plate being slidably receivable between the outermost roof shingle and the next underlayer;

said major pad member capable of receiving therethrough fastener means at a location distant from said minor pad member for joining said support pad to the roof of the building such that the slot extends generally parallel to and adjacent the roof line at the eaves of the building;

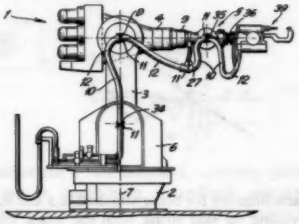
the slot being capable of receiving the hanger strap therethrough until the gutter reaches a selected height relative to the eaves, at which point, the hanger strap is bent about said mounting strip, first forwardly, then downwardly, thereby allowing freedom of swinging movement of the hanger strap on said mounting strip.

4,705,243

SYSTEM OF EXTERNALLY HOLDING AND GUIDING SUPPLY LINES TO MOVING IMPLEMENTS OF MANIPULATORS

Georg Hartmann, Aichach; Kurt Wiedemann, Augsburg, and Ernst Zimmer, Friedberg, all of Fed. Rep. of Germany, assignors to KUKA Schweissanlangen and Roboter GmbH, both of, Fed. Rep. of Germany

PCT No. PCT/EP84/00304, § 371 Date Jun. 10, 1985, § 102(e) Date Jun. 10, 1985, PCT Pub. No. WO85/01686, PCT Pub. Date Apr. 25, 1985
PCT Filed Oct. 4, 1984, Ser. No. 743,320
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337948; Sep. 22, 1984, 3434899
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—51 17 Claims



1. A manipulator system comprising:

a base (2);

a pivot member (6) on said base;

a swing arm (3) pivotally connected to said pivot member at one end thereof for rotation about a first pivot axis (34) to said pivot member (6), said swing arm having an opposite end and a longitudinal axis between its one and opposite ends extending perpendicularly to said first pivot axis;

an upper arm (4) having one end pivotally connected to said swing arm at a second pivot axis (8), said upper arm having an opposite end, and a longitudinal axis extending between its one and opposite ends and extending perpendicularly to said second pivot axis;

a wrist (5) pivotally connected to said opposite end of said upper arm;

a tool (39) connected to said wrist;

a supply line (10) comprising a bundle of individual lines extending from said base along said swing arm and said upper arm and being connected to said tool;

a first holder having a tubular portion receiving said supply line rotatably mounted to said swing arm for rotation about said first pivot axis;

a second holder having a tubular portion receiving said supply line and pivotally mounted to said upper arm for rotation about said second pivot axis;

said pivot axes of said first and second holders lying in a common plane with said longitudinal axis of said swing arm and being positioned at a lateral side of said swing arm; and a third holder having a tubular portion rotatably mounted to said upper arm at said opposite end of said upper arm and with a rotation axis which, with said pivot axis of said second holder, lie in a common plane with said longitudinal axis of said upper arm, said second and third holders being disposed on one lateral side of said upper arm.

4,705,244

TUBE PROTECTING DEVICE

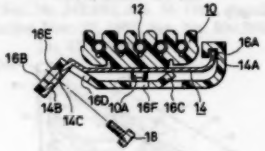
Kaoru Saotome, Toyota; Hiroyuki Sasaki, and Katsuhiro Kanbara, both of Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha; Nihon Sekiso Kogyo and Maruyasu Industries Co., Ltd., all of Aichi, Japan

Filed May 21, 1986, Ser. No. 865,273

Claims priority, application Japan, May 23, 1985, 60-76928[U]

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—68.1 **9 Claims**



1. A tube protecting device comprising:

a clamp support having a first end portion and a second opposite end portion with at least one clamp element attached therebetween for supporting an undersurface of at least one tube, said first end portion being bent to project away from the clamp support;

tube protecting means removably attached to said clamp support and having a protection surface for covering at least an undersurface of said at least one tube, said protection surface having a recess portion and an opposite engageable end portion, a spring portion being located adjacent said recess portion for biasing said first end portion of said clamp support into engagement with said recess, and said second end portion of said clamp support into engagement with said engageable end portion of said tube protecting means, said spring portion being integrally formed on said tube protecting means and defined by a tab cut from said protection surface and projecting therefrom toward said clamp support.

4,705,245

DEVICE FOR BINDING WIRES OR THE LIKE

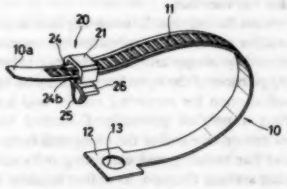
Hiroshi Osada, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Jul. 18, 1986, Ser. No. 886,611

Claims priority, application Japan, Jul. 27, 1985, 60-115233[U]

Int. Cl.[4] F16L *3/03*

U.S. Cl. 248—74.3 **7 Claims**



1. A device for binding wires or the like, said device comprising a band and a buckle;

said band having at least two side surfaces and two ends;

said band having a plurality of lock grooves formed on one of said at least two side surfaces thereof and a coupling hole formed adjacent to one of said two ends thereof;

said buckle comprising a buckle body having an outer surfce and an insertion hole defined by at least two inside walls for inserting said band therethrough, said insertion hole having an inlet for said band and an outlet for said band, an elastic ratchet pawl extending obliquely from one of said at least two inside walls of said buckle body defining said insertion hole toward the outlet of said insertion hole for said band, and lock means extending from the outer surface of said buckle body, inserted into said coupling hole of said band and engaged with edges of said coupling hole;

the other one of said two ends of said band being inserted through said insertion hole of said buckle body from the inlet of said insertion hole for said band to permit said elastic ratchet pawl to rub said lock grooves and retain said band within said insertion hole of said buckle body so as to be slidable only in the direction from the inlet to the outlet of said insertion hole.

4,705,246

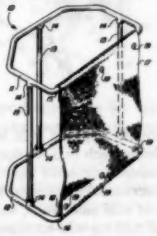
BAG FRAME

William Wolf, 116 Massachusetts Ave., Congers, N.Y. 10920

Filed Dec. 23, 1985, Ser. No. 812,800

Int. Cl.[4] B65B *67/12*

U.S. Cl. 248—97 **6 Claims**



1. A bag frame for facilitating the filling of a bag, said bag having a bag opening, said bag frame comprising:

filling ring means for exteriorly supporting said bag adjacent said bag opening and for defining the shape of said bag opening;

base ring means for supporting said bag frame upon a work surface, said base ring means in spaced relationship to said filling ring means;

strut means for supportingly defining said spaced relationship between said filling ring means and said base ring means, said strut means having first and second ends, said strut means having first and second ends, said first end coupled to said base ring means, said second end coupled to said filling ring means; and

bag retainer means releasably coupled to said filling ring means and said base ring means for releasably retaining said bag within said bag frame,

wherein said filling ring means is defined along a peripheral portion as a straight filling bar, wherein said base ring means is defined along a peripheral portion as a straight base bar, said straight filling bar is parallel to said straight base bar, said straight filling bar and said straight base bar defining a plane, said bag retainer means substantially within said plane.

4,705,247

COLLAPSIBLE UTILITY CART

Paul E. Delmerico, Winchester, Va., assignor to Rubbermaid Commercial Products, Inc., Winchester, Va.

Filed Sep. 11, 1985, Ser. No. 774,770

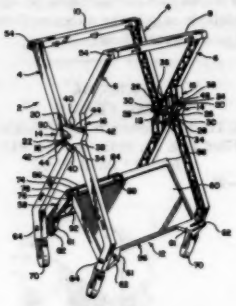
Int. Cl.[4] B62B *3/02*

U.S. Cl. 248—98 **10 Claims**

1. In a collapsible cart of the type having first and second pairs of elongate crossing support legs at opposite sides, each said pair comprising an outwardly disposed leg mid-section

and an inwardly disposed leg mid-section pivotally connected together, whereby remote upper and lower end segments of said legs, which extend from said mid-sections, diverge into a free-standing position and converge into a storage position, the improvement comprising:

said mid-sections of said pivotally connected legs having opposing incut channels extending transversely to each other and interfitting, whereby said legs at each said cart side being disposed in a common plane, each mid-section having top and bottom outward facing surfaces, with each mid-section channel extending between said surfaces defined by internally opposed side walls; each pair of said sidewalls defining each mid-section channel and comprising first and second segments tapering toward and adjoining along a fulcrum edge situated substantially intermediately of ends of said side walls; said top and bottom surfaces of one of said leg mid-sections engaging and reciprocally pivoting over said fulcrum edge of said opposed side walls of said opposite mid-section channel to engage substantially the length of first wall segments in said free standing position and engage substantially the length of second wall segments in said storage position.



4,705,248

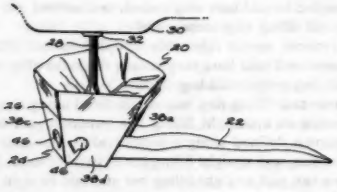
FLUID COLLECTION AND DISPOSAL APPARATUS

Jonothon M. W. McIntyre, 13535 Valerio St., Apt. 113, Van Nuys, Calif. 91405

Filed Jun. 24, 1986, Ser. No. 878,025

Int. Cl.[4] B65B *67/12*

U.S. Cl. 248—99 **19 Claims**



14. A fluid collection apparatus, comprising:

at least two rigid sheets connected to one another at their ends, the at least two sheets being pulled apart from an initially folded flat configuration to form a drain stand and to define a drain stand interior therebetween;

an inner support panel extending from one of the sheets inwardly and downwardly into the drain stand interior to form a trough sufficiently wide to permit fluid to flow therethrough, yet narrow enough to prevent larger solid objects from falling therethrough; and

a fluid impermeable bag-like enclosure means for receiving and holding fluids to be collected, the enclosure means having an open end which engages the drain stand in a manner holding the end in an open, fluid receiving position, an intermediate portion extending from the open end to the trough, and a closed-end portion extending through and beyond the trough.

4,705,249

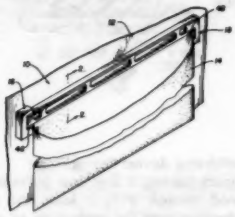
TRASH BAG HOLDING DEVICE

Preston Edwards, 11202 Valley Heights Clr., Boise, Id. 83709

Continuation-in-part of Ser. No. 728,228, Apr. 29, 1985, abandoned. This application Sep. 29, 1986, Ser. No. 912,405

Int. Cl.[4] B65B *67/04*

U.S. Cl. 248—101 **4 Claims**



1. A bag holding device adapted to be mounted on a supporting wall to hold and spread the open end of a thin walled flexible refuse bag, comprising

a first spreader bar member, said first spreader bar member including an elongated body having an upwardly directed clamping surface extending along its length,

mounting means for rigidly mounting said first spreader bar member on a supporting wall,

a second spreader bar member, said second spreader bar member including a second elongated body having a downwardly directed bag clamping surface extending along its length,

said clamping surfaces being adapted to clamp a portion of the wall of a bag adjacent the open mouth of the bag when the open mouth is draped over and covers the clamping surface of the first spreader bar member,

means on said clamping surfaces for providing a high friction contact with the thin wall of a trash bag held in the device, said means providing high friction contact including tongue and groove means including at least one groove formed in and extending the full length of the clamping surface on one said spreader bar member and at least one complementary tongue formed on and extending the full length of the clamping surface of the other spreader bar member,

locking means for releasably retaining said second spreader bar member on said first spreader bar member to firmly but releasably clamp and hold the bag whereby the remaining portion of the open bag top may be easily grasped and pulled open for receiving refuse, said locking means including a pair of generally C-shaped locking joints formed one on one end of the elongated body of each said spreader bar member and extending outwardly from the clamping surface thereon, to define an axial extension on each said body member, each said locking joint defining a longitudinally extending recess for telescopingly receiving the other end of the other elongated body to releasably retain said second spreader bar member on said first spreader bar member, said C-shaped locking joints on said spreader bar member providing a through opening at each end of the bag holding device when said first and second spreader bar members are assembled to enable excess bag material at each extremity of the clamped portion of the bag to pass between the spreader bar members without being clamped whereby a single layer only of a bag can be

clamped between opposed clamping surfaces of said spreader bar members.

4,705,250

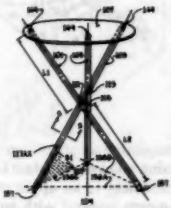
SUPPORT STRUCTURE FOR TABLETOPS, CHAIR SEATS AND THE LIKE

Jerome K. Eastman, 3 E. Ontario, Chicago, Ill. 60611

Continuation of Ser. No. 342,882, Jan. 26, 1982, abandoned. This application Nov. 20, 1985, Ser. No. 800,090

Int. Cl.[4] F16M *11/32*

U.S. Cl. 248—164 **11 Claims**



1. A support structure for supporting a table top or the like above a supporting surface, the support structure comprising:

(a) a plurality of rigid members, each member

(i) having an upper end proximate to the table top and a lower end proximate to the supporting surface and

(ii) supporting a portion of the table top above the supporting surface, and

(b) a plurality of connecting means for connecting the members, each connecting means including an elongate metal piece and means providing metal surface portions engaged with said elongate metal piece along the length thereof with said piece being arranged to act in one capacity as a pin which cooperates with said metal surface portions to connect adjacent members and to prevent relative movement in any direction angularly related to the longitudinal axis of said piece,

(c) wherein each member contacts and is fixedly connected to

(i) a first adjacent member at a first interface by a first one of said connecting means and

(ii) a second adjacent member at a second interface by a second one of said connecting means, said second interface being spaced from said first interface, each member thereby also supporting two adjacent members, and

(d) wherein said plurality of connecting means fixedly maintains said plurality of members in a rigid configuration in which

(i) the lower ends of the members define a polygon;

(ii) the plane defined by one side of said polygon and a central axis of a member defining said side intersects the plane of said polygon at a support angle, said support angle being an acute angle, and

(iii) the longitudinal axis of each elongate metal piece intersects the plane of said polygon at an acute angle, each elongate metal piece cooperating with metal surface portions engaged therewith to resist relative pivotal movement about axes which intersect the longitudinal axis thereof and to also resist relative movement in response to forces in various directions angularly related to said longitudinal axis including directions which are either perpendicular or parallel to the plane of said polygon.

4,705,251

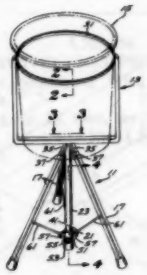
SELF-ERECTING TRIPOD APPARATUS

Soren Samuelsson, 74-259 Candlewood St., Palm Desert, Calif. 92260

Filed Aug. 25, 1986, Ser. No. 900,329

Int. Cl.[4] G03B *21/56*

U.S. Cl. 248—171 **3 Claims**



1. A self-expanding tripod apparatus for supporting a container platform in an elevated positon and comprising:

a mounting platform;

a mounting bracket under said platform comprising three rigid downwardly and outwardly angled stub rods;

three support legs of a predetermined length pivotally mounted below their upper ends to said rods and pivotable between respective positions with their lower ends collapsed inwardly toward one another and respective support positions disposed expanded outwardly away from one another;

stop means comprising portions of said legs projection above said pivots for abutting said rods to limit said support legs from pivoting outwardly away from one another beyond said respective support positions;

an elongated telescopical actuator including upper and lower members having a combined length greater than said predetermined length, the upper end of said upper member being affixed to said platform and said lower member arranged to telescope vertically with respect to said upper member;

a collar mounted slidably on said lower member for sliding vertically with respect thereto;

a foot mounted on the bottom end of said lower member;

a coil spring interposed between said foot and collar for biasing said collar upwardly away from said foot;

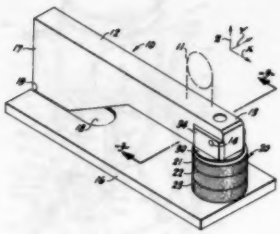
three coupling links pivotally connected on their opposite ends to said collar and legs, respectively, said coupling links, foot and spring being so sized and arranged as to cause said foot, when said support legs are in said retracted positions, to project beyond the bottom ends of said support legs to, when said apparatus is lower end onto a support surface, cause said foot to engage such support surface to drive said lower member upwardly causing said spring to drive said collar upwardly to drive the bottoms of said links upwardly to drive the lower extremities of said support legs outwardly to said support positions to engage said stop means, so that continued upward travel of said foot relative to said collar will cause said spring to collapse to permit said lower member to be driven upwardly relative to said collar whereby said apparatus may be supported on a support surface with said foot being in a plane different from that of said bottom ends of said support legs.

4,705,252

X, Y, Z POSITIONER

George F. Goers, Tracy, Calif., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Aug. 8, 1986, Ser. No. 894,523
Int. Cl.[4] F16M *11/04*
U.S. Cl. 248—178 11 Claims



5. A three-axis, x, y, z position adjuster system comprising a base;

at least a pair of three-axis position adjusters, each adjuster comprising

(a) mounting means including a hollow shaft of polygonal cross-section;

(b) a stack of x, y and z adjuster means mounted n seriatim along the z-axis between the mounting means and the base for controllingmovement of the mounting means along the x, y and z axes;

(c) means for securing the mounting means and the three adjuster means to the base;

(d) the z-adjuster means comprising a circular jack screw fixedly supported on the base to prevent rotation and a jack housig rotatably threaded on the periphery of the jack screw for rotationt hereon to reversibly move the jack housing, the second and third adjuster means and the mounting means along the z-axis;

(e) the y-adjuster means comprising a first eccentric having a circular peripheral surface and a first elongated planar slot therein, and being mounted over the jack housing with the shaft extending through the first slot and aligning the length of the slot parallel to the x-axis for confining movement of the eccentric to that along the y-axis; and a first collar rotatably mounted about the eccentric;

(f) the x-adjuster means comprising a second eccentric having a circular periphery and a second elongated planr slot therein, the eccentric being mounted over the y-adjuster means with the shaft extending through the second slot aligning the length of the slot parallel to the y-axis for confining movement of the slot along the x-axis; and a second collar mounted for rotation about the periphery of the second eccentric;

the said mounting of the x- and y-adjuster means on the shaft translating rotation of their collars into reversible movement, respectively, of the x- and y-eccentrics, and the shaft and mounting means, along the x-and y-axes; and

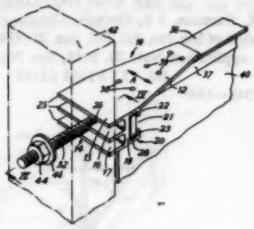
mounting arm means extending between the mounting means of said three-axis positioners for mounting objects thereon for three-axis positioning responsive to the selected operation of the adjuster means.

4,705,253

OFFSET SIGN MOUNTING

Robert A. H. Heard, Backwell, England, assignor to Signfix Limited, Backwell, England

Filed May 30, 1985, Ser. No. 739,194
Claims priority, application United Kingdom, Jun. 1, 1984, 8414037
Int. Cl.[4] G09F *15/00*
U.S. Cl. 248—219.4 11 Claims



1. A bracket for mounting an offset sign to a supporting post, the bracket comprising an elongate plate for extending lengthwise of and for attachment to an upper or lower edge of the sign, first channel means integral with and at one end of the plate and extending transversely of the direction of elongation of the plate for seating against the post with the plane of the plate normal to the axis of the post, said first channel means having parallel walls presenting surfaces for abutment with a said post, the walls being joined by a web which is pierced by an aperture, the side of the web remote from said first channel means being arranged to provide a second open-ended channel means opposite said web, the second channel means extending in a direction parallel to the plane of the plate and transverse to the length of the plate, said second channel means including second wall means opposite said web, whereby said second channel means can alternatively receive a tensile strap passing around the post or a bar having a threaded aperture in register with said aperture in said web and engaged by an externally threaded rod inserted through the aperture in said web, said second wall means providing an obstruction to the adjacent end of said threaded rod, limiting the extent to which the rod can be screwed through said bar.

4,705,254

ADJUSTABLE AND REMOVABLE VICE STAND ASSEMBLY FOR MOTOR VEHICLE

Mark G. Swanson, R.R. #1, Box 604, Idaho Springs, Colo. 80452

Filed Jun. 10, 1985, Ser. No. 742,945
Int. Cl.[4] A47G *29/00*
U.S. Cl. 248—287 20 Claims

1. An adjustable and removable vice assembly for use on a pickup truck of the type having a cargo carrying box and a rearwardly opening, horizontally foldable tailgate assembly associated with the cargo carrying box comprising:

elongated receiving means fixedly mounted on a rear end portion of the pickup truck proximate and below the tailgate assembly in generally parallel alignment with a longitudinal axis of the pickup truck for slidingly receiving and holding an elongated support member means therein;

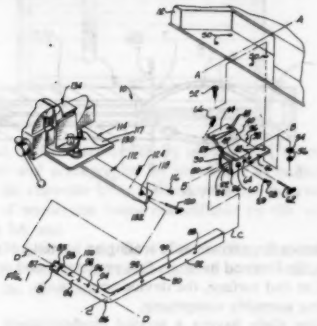
elongated support member means receivable in said receiving means in rearwardly extending relationship therewith for supporting a slide member means thereon said elongated support member means being longitudinally slidingly adjustable with respect to said elongated receiving means and having a first longitudinally extending portion and a second inclined portion extending upwardly from said first portion;

slide member means for supporting a vice means thereon, said slide member means being vertically slidingly adjustable on said elongated support member means and extending upwardly therefrom;

vice means for selectively gripping and holding a work piece mounted on said slide member means in fixed relationship therewith;

stabilizing and holding means operatively associated with said elongated receiving means, said elongated support means and said slide member means for selectively stably holding said receiving means, said support means and said slide member means in a plurality of selected fixed relationships;

said elongated support member means first longitudinally extending portion being of sufficient length whereby said



slide member means is adjustably positionable rearwardly of the rearwardly opening tailgate when the tailgate is in a generally horizontal, outwardly folded position;

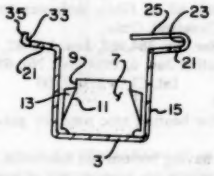
said elongated support member means second longitudinally extending portion being of a sufficient length whereby said slide member means is adjustably positionable thereon at the same elevation as the rearwardly opening tailgate when the tailgate is in a generally horizontal, outwardly folded position; whereby said slide member means is positionable next adjacent the tailgate when the tailgate is in a generally horizontal, outwardly folded position and whereby no portion of said removable vice assembly is positioned in obstructing relationship with a horizontal work surface provided by the tailgate when the tailgate is in said generally horizontal, outwardly folded position.

4,705,255

TWIST LOCK INVERTED T-RAIL CLIP

Gueary T. Reed, Jr., Lee County, Miss., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 29, 1985, Ser. No. 696,008
Int. Cl.[4] A47H *1/10*
U.S. Cl. 248—317 **21 Claims**



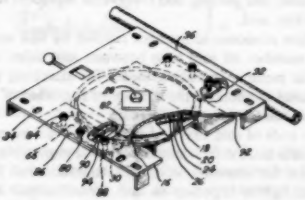
1. A one-piece clip for supporting a lighting fixture or the like from a support structure, the clip including an upper part, said upper part including means for attaching the clip to the structure and a depending lower part integral with the upper part, the lower part comprising attachment means for extending through an opening in the upper wall of the fixture and springing outwardly to engage the edge of the opening. the attachment means comprising a pair of generally vertical legs attached to the upper part, a web part connecting the legs, and a pair of arms extending upwardly and outwardly from the web, the arms being proportioned to be compressed slightly as the attachment means are pushed into the opening.

4,705,256

SWIVEL SEAT PEDESTAL

James Hofrichter, Reedsburg, Wis., assignor to Seats, Inc., Reedsburg, Wis.

Filed Jul. 23, 1986, Ser. No. 889,798
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—418 **14 Claims**



1. An improved swivel seat pedestal of the type usable on a apparatus moveable, the improved swivel seat pedestal including in combination:

(a) seat support means for supporting a seat on the moveable apparatus;

(b) a circular base plate secured to the support means and having a forward edge and a rearward edge;

(c) a swivel plate;

(d) rotation means for rotatably securing the swivel plate to the base plate;

(e) a seat mounted on the side of the swivel plate opposite the side facing the base plate;

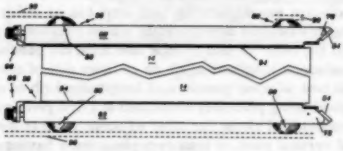
(f) at least a first bearing clamp secured to swivel plate and having a first bearing lip extending adjacent the base plate whereby loads placed on the swivel plate are transferrable through the bearing clamp to the base plate and from the base plate to the support means.

4,705,257

SHOCK AND VIBRATION ISOLATION MOUNTING

Cosmo L. Leo, Waltham, and Stanley W. Stefanick, Uxbridge, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 23, 1987, Ser. No. 29,328
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—611 **17 Claims**



1. Shock and vibration isolation mounting apparatus for releasably connecting two articles together comprising:

(a) a first rigid channel member being U-shaped in cross

section and comprising a base separating a pair of parallel spaced sides, said first channel member having a transverse member at one end perpendicular to both said base and said sides, said transverse member having a bore therethrough, said first channel member including means for attaching said first channel member to the surface of one of the articles to be connected;

(b) a second rigid channel member also being U-shaped in cross section and comprising a base separating a pair of parallel spaced sides, said second channel member also having a transverse member at one end perpendicular to both said base and said sides, said transverse member having a threaded bore therethrough, said second channel member being sized to slidably fit within said first channel member;

(c) threaded bolt means having a head on one end for passing through said bore of said first channel member and threadedly engaging said threaded bore of said second channel member and pulling said transverse members towards one another; and,

(d) a first elastomeric member carried by said second channel member on said base between said sides, said elastomeric member including means for attaching said second channel member to the surface of the other of the articles to be connected; and wherein,

(e) the ends of said first and second channel members opposite said transverse members include engagable interactive means for drawing said ends together and for holding them tightly together as said threaded bolt means pulls said transverse members towards one another.

4,705,258
SHEATHING FOR POURING A CONTAINER FABRICATED FROM CONCRETE

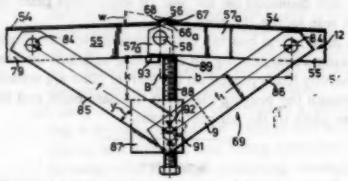
Peter Frei, Widnau, Fed. Rep. of Germany, assignor to Frei & Egger AG, Au/Schweiz, Switzerland

Filed Jul. 30, 1985, Ser. No. 760,676

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1984, 3428036; Nov. 16, 1984, 8433597

Int. Cl.[4] E04G *9/08*

U.S. Cl. 249—27 **19 Claims**



1. A sheathing for use as a covering on a polygonal container having a plurality of adjustable support members for supporting said sheathing wherein the sheathing comprises at least two adjacent panels having a vertical joint therebetween, the improvement which comprises one edge of one of said at least two adjacent panels forming said joint has an offset vertical edge with a stepped configuration which overlies an adjacent edge of the other of said at least two adjacent panels, at least one horizontal longitudinal rib on an inner side of each of said at least two adjacent panels, said longitudinal rib of one adjacent panel being pivotably connected at a first pivot point with said longitudinal rib on the other adjacent panel in the vicinity of said vertical joint, at least two plates each having one portion pivotably connected to each other at a second pivot point and another portion pivotably connected to a respective one of the longitudinal ribs of said at least two adjacent panels at a third pivot point spaced from said first pivot point, and adjustable tensioning means for adjusting the distance between said first pivot point and said second pivot point for articulating said adjacent panels.

4,705,259
DEVICE FOR SEALING AN OPENING AND SLIDE VALVE COMPRISING SUCH A DEVICE

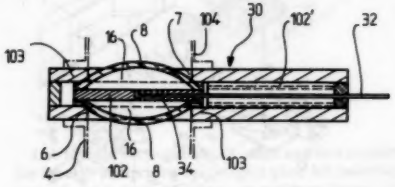
Gérard Dolben, Moret S. Loing; Claude Oberlin, Avon; Jean-Claude Lemarquis, Moret S. Loing, and Daniel Bandura, Cesson, all of France, assignors to Electricite de France (Service National), Paris, France

Filed Jun. 26, 1985, Ser. No. 749,017

Claims priority, application France, Jun. 26, 1984, 84 10031

Int. Cl.[4] F16K *3/16*

U.S. Cl. 251—61.1 **4 Claims**



1. A device for permanently sealing an opening of a free end of a pipe, the free end having a first predetermined outer diameter and an end surface, the device comprising:

a sealing assembly comprising;

a sealing plate having a second predetermined diameter greater than the first predetermined outer diameter of the pipe, the sealing plate having a communication hole and an outer edge portion,

a flexible membrane having a third predetermined diameter generally equal to the second predetermined diameter of the sealing plate, the membrane having a peripheral portion and a sealing portion concentric with the preipheral portion of the flexible membrane,

an annular ring securd to the outer edge portion of the sealing plate and extending concentrically about the free end of the pipe, the annular ring secured to the sealing plate to clamp the peripheral portion therebetween to define a volume, the volume being in communication with the communication hole and thereby in communication with a source of pressurized fluid, and

means for securing the sealing assembly to the pipe with the ring positioned to encircle the free end of the pipe and the flexible membrane abutting the edge of the pipe, such that the membrane sealingly contacts the end surface of the pipe when the volume is pressurized by fluid from the source of pressurized fluid.

4,705,260
FURNACE FOR HEATING AND MELTING ZINC

Ralph D. Geer, Warren; Robert L. Morgan, Niles, and Dexter S. Senek, Cortland, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Continuation of Ser. No. 384,968, Jun. 4, 1982, abandoned. This application Jun. 6, 1984, Ser. No. 617,830

Int. Cl.[4] F27D *1/00*

U.S. Cl. 266—78 **4 Claims**

1. A furnace for heating zinc used for galvanization, comprising:

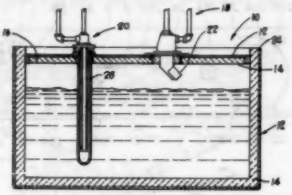
(a) a reservoir having bottom and side walls, inwardly facing surfaces of which are constructed of non-ferrous refractory materials, and an upper opening;

(b) a vertically movable horizontal furnace lid receivable in the upper opening within the side walls covering the reservoir and adjustable within the side walls in its height from the bottom wall while being maintained horizontal,

the inwardly facing surface of said lid being constructed of non-ferrous refractory material;

(c) a plurality of pre-heaters carried by said furnace lid and constructed and arranged to heat the furnace walls before the furnace is charged with zinc by directing heat toward inwardly facing wall surfaces of the reservoir;

(d) a plurality of immersion heaters each having an outer immersible element constructed of non-ferrous refractory



material, said heaters carried by said furnace lid and constructed and arranged to be immersed in molten zinc within the reservoir when the lid covers the reservoir, the extent of immersion being controllable by the movable furnace lid; and

(e) means including said lid for controlling the extent of immersion of the immersion heaters in the molten zinc within the reservoir.

4,705,261

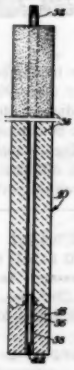
WIRE INJECTION NOZZLE

Emil J. Wirth, Jr., Yardley, Pa., assignor to Pfizer Inc., New York, N.Y.

Filed Nov. 28, 1986, Ser. No. 936,058

Int. Cl.[4] C21C *7/00*

U.S. Cl. 266—287 **5 Claims**



1. An injection nozzle for the addition of an agent in wire form directly into the interior of a molten material, which comprises a tip having an axial bore with a terminal opening through which the wire exits the nozzle, the terminal opening having a cross section in the form of a star configured to produce a multitude of independent gas jets symmetrically surrounding the exiting wire.

4,705,262

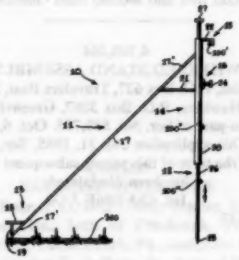
FENCE INSTALLATION APPARATUS

Ronald R. Roberts, 24 Locke St., Box 528, Woodsboro, Tex. 78393

Filed Oct. 7, 1986, Ser. No. 916,906

Int. Cl.[4] B21F *27/00*; E04H *17/02*

U.S. Cl. 256—37 **6 Claims**



1. A fence installing apparatus used in combination with a plurality of strands of fencewire; wherein the apparatus comprises:

a stabilizing unit comprising an elongated rod member; and,

a brace unit comprising an elongated brace member having a ground engaging unit disposed on its lower end and a tubular unit disposed on its upper end; wherein, the brace member is angularly disposed with respect to said ground engaging unit and said tubular unit; wherein said tubular unit is dimensioned to slidably receive said elongated rod member; and, wherein said brace unit further comprises: a retaining unit provided on the upper portion of said tubular unit and comprising a relatively short arm member having a downwardly depending lip element; wherein, the lip member is configured to engage and restrain one of said plurality of strands of fencewire.

4,705,263

FLUID-FILLED BUSHING

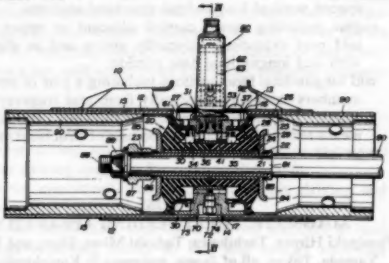
Kazuo Matsuura; Hiroshi Yoshioka, and Kiyoshi Koga, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1986, Ser. No. 850,329

Claims priority, application Japan, Apr. 12, 1985, 60-54687[U]

Int. Cl.[4] B23P *11/00*

U.S. Cl. 267—33 **3 Claims**



1. A fluid-filled bushing comprising:

at least two sleeves disposed in concentric relation to each other;

a resilient member interposed between said two sleeves and having a substantially annular recess defined in an outer circumferential surface thereof;

a partition disposed in said annular recess and having holes defined therein and defining first and second substantially annular fluid chambers in said annular recess which selectively communicate with each other through said holes of the partition;

a fluid filled in each of said first and second fluid chambers; and

valve means for variably restricting the flow of said fluid between said first and second fluid chambers.

4,705,264

WHEELED STAND ASSEMBLY

Joel W. Hawkins, P.O. Box 627, Travelers Rest, S.C. 29690, and Patrick G. Hawkins, P.O. Box 3867, Greenville, S.C. 29608

Continuation-in-part of Ser. No. 539,755, Oct. 6, 1983, Pat. No. 4,533,127. This application Jul. 31, 1985, Ser. No. 761,176

The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.

Int. Cl.[4] B66F *3/00*

U.S. Cl. 269—17 **5 Claims**

1. An engine stand having a base formed from a transverse base member, and a longitudinal base portion extending forwardly from said transverse base member; said base being supported by wheels, comprising:

a post carried by said base and being inclined rearwardly toward said transverse base portion;

said post being secured to said base by a single transverse bolt;

a pair of upright straps carried by said transverse base member on one end and tapering inwardly toward and being removably connected to said post on the other end;

a pair of spaced vertical longitudinal structural sections forming a part of said base;

fastening means removably securing said post betweeen said spaced vertical longitudinal structural sections;

engine mounting means carried adjacent an upper end of said post extending outwardly above and in alignment with said longitudinal base portion;

said longitudinal base portions including a pair of structural members extending outwardly from said transverse base member in generally longitudinal alignment; and fastening means removably securing said pair of structural members to said transverse base member.

4,705,265

AUTOMATIC SHEET FEEDING APPARATUS

Fumiyuki Hirota, Tachikawa; Tadashi Miwa, Hino, and Yasushi Yamada, Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

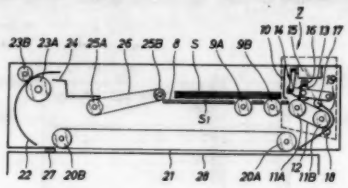
Filed Mar. 3, 1986, Ser. No. 835,473

Claims priority, application Japan, Mar. 11, 1985, 60-48925; Mar. 11, 1985, 60-48930

Int. Cl.[4] B65H *3/50*

U.S. Cl. 271—122 **6 Claims**

1. An automatic sheet feeding apparatus for feeding sheets on a stacker one by one, characterized by comprising a separation device having a sheet convey member for conveying a separated sheet and a double feed prevention member which is brought into tight contact with or separated from said convey member, and a sheet stop member for preventing movement of nonseparated sheets along a convey direction, wherein when said separation device is in tight contact with said sheet during a separation operation, said sheet stop member is located in a



first position where said sheet stop member does not prevent the separation operation; and when said separation device is released and the sheet is conveyed, said sheet stop member is moved to a second position where said sheet stop member abuts against leading ends of sheets except for a sheet to be fed, thereby preventing movement of the sheets except for the sheet to be fed.

4,705,266

SHEET CONVEY DEVICE

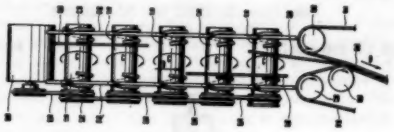
Tsutomu Sasage; Minoru Matsumoto, and Toru Yoshikawa, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Nov. 12, 1986, Ser. No. 930,790

Claims priority, application Japan, Nov. 22, 1985, 60-180863[U]

Int. Cl.[4] B65H *51/06*

U.S. Cl. 271—264 **5 Claims**



1. A sheet convey device having convey means including a plurality of feed rollers for conveying a sheet in a standing state, and a guide portion adjacent said feed rollers for guiding and supporting the sheet to be conveyed, wherein said device further comprises helical rings, wound on two ends of at least one of said feed rollers in different winding directions, for guiding the sheet toward central portions of said feed rollers.

4,705,267

CONVERTIBLE WIND LOAD EXERCISE DEVICE

W. Shaun Jackson, 2860 Tessmer, Ann Arbor, Mich. 48103

Filed Apr. 11, 1985, Ser. No. 722,283

Int. Cl.[4] A63B *21/00, 69/06, 69/16*

U.S. Cl. 272—134 **13 Claims**

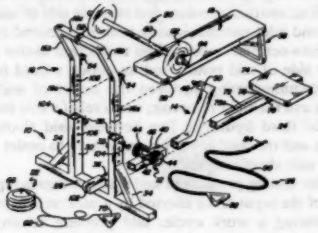
1. An exercise device comprising:

(A) a stand adapted to be positioned on a support surface and including a generally horizontal member adapted to be supported on the support surface and a generally vertical member extending upwardly from said horizontal member;

(B) a blower assembly rotatably mounted on said stand and including at least one blower wheel and a drive roller;

(C) bicycle mounting means on said stand for removably supporting a bicycle of the type including a rear wheel

including a rear axle, a tire mounted on the rear wheel, and a pedal system for driving the rear wheel, said bicycle mounting means including means on said upright member for engaging the rear axle of the bicycle and being operative to support the bicycle on said stand in a position with the tire of the rear wheel of the bicycle is spaced above the support surface but frictionally engages said drive toller so that a user pedalling the bicycle will drive the rear wheel of the bicycle and thereby said blower wheel to simulate a wind load and provide lower body exercise;



(D) a bench having means at one end for removably securing said one end to said vertical member, with the bicycle removed, and having leg means adjacent its other end sized to maintain said bench in a generally horizontal position when its one end is removably secured to said vertical member; and

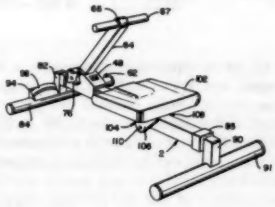
(E) means on said vertical member for supporting a bar in spaced position over said one end of said bench so tht, with weights attached to the opposite ends of the bar, a user lying on his back on said bench may repetively press the bar and attached weights to provide upper body exercise.

4,705,268

TOY EXERCIZING MACHINE FOR CHILDREN

Richard P. Nadeau, Frankfort, N.Y., assignor to Zorcom Enterprise, Inc., Utica, N.Y.

Filed Dec. 9, 1985, Ser. No. 806,339
Int. Cl.[4] A63B *69/06*
U.S. Cl. 272—72 **18 Claims**



1. A child's exercise machine comprising:

(a) a beam member having first and second ends;

(b) first support leg having a projection portion;

(c) second support leg having a projection portion;

(d) first and second socket means, associated with respective said first and second ends for receiving respective first and second projection portions;

(e) an exercise bar movable between a first and a second position;

(f) a bracket member, associated with said beam member for pivotally supporting said exercise bar as said exercise bar moves between said first and seconds positions;

(g) a seat slidably mounted on said beam member;

(h) means for detecting when said exercise bar has reached said first position and for detecting when said exercise bar has reached said second position; and,

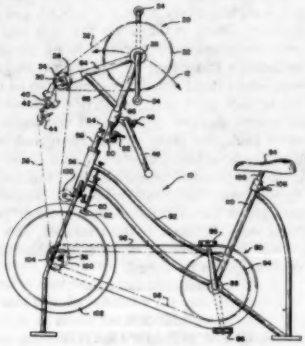
(i) speaker means for producing a first sound when said detecting means has detected that said exercise bar is in a first position and for producing a second sound when said detecting means has detected that said exercise bar is in a second position.

4,705,269

EXERCISE APPARATUS

William M. DeBoer, P.O. Box 17626; Stanley E. DeBoer, Jr., 3619 McCrady Rd., both of Pittsburgh, Pa. 15235, and Robert C. Hykes, Turtle Creek, Pa., assignors to William M. DeBoer, and Stanley E. DeBoer, Jr., both of Pittsburgh, Pa.

Filed Oct. 25, 1985, Ser. No. 791,477
Int. Cl.[4] A63B *21/00*; A61H *1/02*
U.S. Cl. 272—73 **25 Claims**



1. An upper body exercise assembly for attachment to a stationary lower body assembly wherein said lower body exercise assembly includes a lower driving sprocket, means for rotating said lower driving sprocket, a lower driven sprocket operatively connected to said lower driving sprocket for rotation therewith and means connected to said lower driven sprocket for receiving energy from the rotation of said lower driven sprocket, said upper body exercising assembly comprising:

an upper driving sprocket;

means for rotating said upper driving sprocket;

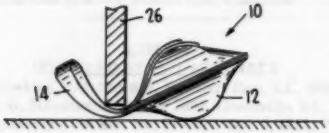
an upper driven sprocket operatively connected to said upper driving sprocket for rotation therewith;

means for operatively connecting said upper driving and driven sprockets;

means for connecting said upper driven sprocket to said energy receiving means so that said energy receiving means receives energy from the rotation of said upper driven sprocket; and

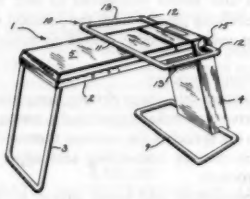
means associated with each of said upper and lower body exercising assemblies for permitting the selective rotation of said upper and lower driving sprockets in isolation or in conjunction with each other, such that rotation of said upper driving sprocket is not imparted to said lower driving sprocket and rotation of said lower driving sprocket is not imparted to said upper driving sprocket.

4,705,270
PORTABLE EXERCISE DEVICE
Florence Melton, 1000 Urlin Ave., Columbus, Ohio 43212
Filed Mar. 6, 1986, Ser. No. 836,558
Int. Cl.[4] A63B *23/00*
U.S. Cl. 272—93 **5 Claims**



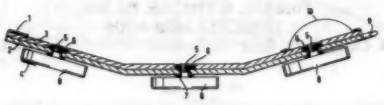
1. An exercise device adapted to extend beneath a door and provide an anchor for one or more body parts of an individual performing exercises, the device comprising an elongated body having a major length and including a rigid element enclosed in a flexible cover, and two straps extending generally transverse to the major length of the body, both ends of each strap being secured directly to the body to thereby form a loop for the reception of the one or more body parts of the individual performing exercises, at least one end of each strap including one portion of a hook-and-loop type releasable fastener, said body having a complementary portion of a hook-and loop type releasable fastener affixed to the cover for each said one portion, each said complementary portions being elongated and extending essentially transverse to the major length of the elongated body and extend a sufficient length so as to engage a door bottom surface, each said one portion capable of engaging each said complementary portions for releasably securing said one end of each said strap to said elongated body, said complementary portions being located on said cover such that when the device is extended beneath a door, force exerted on said straps by the individual results in the one fastener portion being pressed against the complementary fastener portion by wedging action with the door bottom surface, and said portions of each said fastener being of sufficient dimensions that the size of each loop can be varied.

4,705,271
EXERCISE APPARATUS
Michael J. Mondloch, Milwaukee, and Nick Skover, Jr., Dousman, both of Wis., assignors to Applied Power Inc., Brookfield, Wis.
Filed Dec. 21, 1984, Ser. No. 544,681
Int. Cl.[4] A63B *21/24*
U.S. Cl. 272—130 **12 Claims**



1. An exercise apparatus, comprising:
a support;
a bar member pivotally mounted on said support and movable through a work cycle in response to input forces exerted by a user;
hydraulic actuator means connected to said bar member for developing a resistive force against the movement of said bar member, said actuator means includes a hydraulic cylinder, a rod slidably mounted for reciprocal movement within said cylinder and extending through opposite ends thereof, a piston on said rod within said cylinder intermediate the ends of said rod, and hydraulic circuitry including a first hydraulic line communicating between a fluid reservoir and one side of said piston, a second hydraulic line communicating between the fluid reservoir and the other side of said piston, first and second fluid restriction means in said respective first and second hydraulic lines for regulating the flow of fluid through said first and second hydraulic lines, a shuttle valve having a first inlet communicating with said first hydraulic line between said first fluid restriction means and said one side of said piston, a second inlet communicating with said second hydraulic line between said second fluid restriction means and said other side of said piston, and an outlet, a third hydraulic line communicating between the outlet of said shuttle valve and the fluid reservoir, and a relief valve interposed in said third hydraulic line between said shuttle valve outlet and the fluid reservoir responsive to outlet pressure from said shuttle valve;
means for sensing pressure in said actuator means representative of the input force exerted by a user on said bar member during a work cycle, said pressure sensing means comprising a single pressure transducer communicating with said third hydraulic line between said shuttle valve outlet and said relief valve;
means for measuring an angle of rotation of said bar member representative of the displacement of said bar member during a work cycle; and
calculating means using solely the values of the input force from said single force transducer and displacement to calculate the work performed by a user during a cycle.

4,705,272
ITEM OF SPORTS EQUIPMENT OR GAMES DEVICE
Christian Rupprecht, Wiesentalstrasse 46, 7913 Senden, Fed. Rep. of Germany
Filed Feb. 20, 1986, Ser. No. 831,197
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—146 **11 Claims**

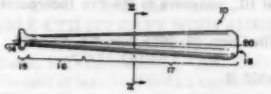


1. An item of sports equipment comprising a supporting plate having upper and lower surfaces comprising a central portion and opposite upwardly inclined end portions, a first rotatable support disk mounted on the under surface of said central portion for rotation about an axis perpendicular to said central portion and second and third rotatable supporting disks disposed symmetrically relative to said central portion mounting on the undersurfaces of said end portions respectively for rotation about respective axes disposed perpendicular to said end portions.

4,705,273
CUSHIONED BAT
Harold E. Ament, Sandwich, and Frederick G. Kirschner, Lagrange, both of Ill., assignors to Ideas That Sell, Inc., Sheridan, Ill.
Filed Sep. 24, 1985, Ser. No. 779,583
Int. Cl.[4] A63B *59/06*
U.S. Cl. 273—72 R **15 Claims**

1. A cushioned bat having a lower end, a handle, a barrel, and an upper end, said cushioned bat comprising a semi-rigid support structure extending along the longitudinal axis of said bat and having a length substantially equal to the cushioned bat

and a deformable, resilient cushion portion surrounding at least a portion of said support structure, said resilient cushion portion being formed of a polyurethane foam having a density from about 10 to about 30 pound mass per cubic foot, said cushioned bat having a length of 25 to 35 inches, a weight of 8 to 30 ounces, a surface hardness, as determined by the ASTM



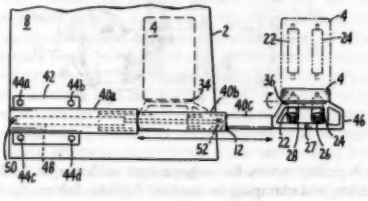
2240-68 method, of from about 25 to about 50, an HA Compressibility of 5 to 50 pounds, and said support structure when tested according to ASTM D790 (modified) requiring a force of from about 75 to about 230 pounds to produce a deflection of 0.5 inch, said cushioned bat having the general shape of a conventional baseball or softball bat but being less likely to inflict serious injury when it comes in contact with a person.

4,705,274

RETRACTABLE SEAT FOR GAMING DEVICES

Joseph G. Lubeck, Unionville, Pa., assignor to Laureate Innovations, Inc., Dover, Del.

Division of Ser. No. 715,646, Mar. 25, 1985, Pat. No. 4,657,257.
This application Dec. 2, 1986, Ser. No. 937,046
Int. Cl.[4] A63B *71/00*; A47C *1/02*; A47G *29/02*
U.S. Cl. 273—148 R **28 Claims**



15. A retractable seat comprising:

(a) an elongate support arm comprising a plurality of hollow support bar sections, said sections having generally circular cross sections and consecutive sections sized to permit one section to be slidably received within the next, said arm fastened at one end to a side vertical standing surface such that the longitudinal axis of said arm lies in a plane parallel to said side vertical surface;

(b) a seat, and

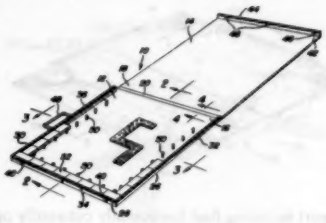
(c) means for joining said seat to the free end of said support arm such that said seat can be selectively positioned perpendicular to, or parallel to, said side vertical standing surface.

4,705,275

DOMINO CARRYING CASE, GAMEBOARD AND GAME PIECE TURNING AND SHUFFLING DEVICE

Frank W. Slater, Durant, Okla., assignor to Southeastern Research and Development, Inc., Durant, Okla.

Filed Mar. 26, 1986, Ser. No. 844,171
Int. Cl.[4] A63F *9/20*
U.S. Cl. 273—309 **9 Claims**



1. A game piece carrying case, gameboard and game piece turning and shuffling device including a pair of large plan area first and second parallel panels disposed in closely spaced juxtapositions and including one pair of generally straight and parallel corresponding marginal edges, an elongated narrow strip panel extending longitudinally along and transversely between said edges and including opposite side longitudinal edges to which said marginal edges are hingedly anchored for swinging of said first and second panels from said juxtapositions to positions coextensive with said strip panel, at least one of said large plan area panels including peripheral curb means extending outwardly therefrom toward the other large panel substantially throughout the peripheral portions thereof exclusive of said one pair of corresponding marginal edges, a plurality of opposite front and rear face equipped game playing pieces loosely receivable in face-down positions between said panels when the latter are in said juxtapositions, the thickness of said pieces, measured between said faces, being the minor dimensions of said pieces and only slightly less than the spacing between said panels, whereby the spacing between said panels is insufficient to allow random turning of said pieces from one face-down position to the opposite face-down positions, said pieces being freely slidable from positions disposed on one said large plan area panel, across said strip panel and onto the other large plan area panel when said large plan area panels are coextensive with said strip panel, said curb means functioning to establish a minimum spaced parallel relationship between said large cross-sectional area panels and to prevent movement of said playing pieces outwardly of said peripheral portions from between said large plan area panels.

4,705,276

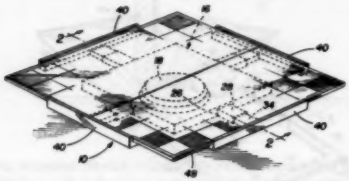
GAMEBOARD SWIVEL

George E. Kastle; Jennie R. Kastle, both of St. Petersburgh; Constance V. Stinedurf, Pinellas Park; James E. Wilson, and Barbara M. Wilson, both of Homosassa Springs, all of Fla., assignors to Swak, Inc., St. Petersburg, Fla.

Filed Mar. 31, 1986, Ser. No. 846,035
Int. Cl.[4] A63F *9/00*
U.S. Cl. 273—309 **8 Claims**

1. A swivel mount for a gameboard, said mount including a base, a horizontal support including an upper surface and an outer periphery and mounted on said base for angular displacement about an upstanding axis passing centrally through said support, a plurality of elongated coplanar support arms disposed generally radially of and spaced about said axis and mounted from said support for longitudinal extension and retraction of said arms relative to adjacent portions of said outer periphery, said arms including outer end portions from which elongated curb members are supported extending trans-

versely of said arms, said curb members including upwardly facing support surface means spaced longitudinally along the curb members for support of a corresponding marginal portion of a gameboard therefrom and upstanding inwardly facing boundary surface means spaced along said curb members outwardly of said support surface means for opposing the marginal edge of said marginal portion, said support surface means being generally coplanar with said upper surfacae, said horizontal support including four horizontally outwardly opening sockets formed therein, disposed beneath said upper surface and in which said support arms are slidingly received, said sockets including center lines disposed on equally angularly spaced radii of said upstanding axis, said horizontal support being generally square in plan shape and said center lines bisecting corresponding outer peripheral sides of said horizontal support.

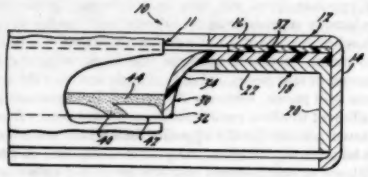


4,705,277

HYDRODYNAMIC SEAL

James A. Repella, Berkley, Mich., assignor to Microdot Inc., Darien, Conn.

Filed Nov. 8, 1984, Ser. No. 669,668
Int. Cl.[4] F16J *15/32, 15/54*
U.S. Cl. 277—134 **3 Claims**



1. A hydrodynamic oil seal comprising

a thin generally cylindrical polytetrafluoroethylene seal element adapted to journal a rotatable shaft and the cylindrical surface of the element facing the shaft having one end portion extending toward an oil side of said seal and an opposite end portion extending toward a dry side of said seal,

the seal element having discontinuous relatively smooth portions at the one end portion thereof orientated in an annular array so as to lie in a radial plane extending at a right angle to the axis of rotation of said shaft and engageable with said rotatable shaft,

said seal element having an annular roughened portion between said annular smooth portions thereof and the opposite end portion of said seal element lying in a plane parallel to the plane of said smooth portions and engageable with said shaft, said roughened portion being defined by randomly orientated peaks and valleys, and

a plurality of hydrodynamic pumping vanes having a roughened surface similar to the annular roughened portion of said element and contiguous therewith and extending therefrom between and defining the annular smooth portions of said seal element at an acute angle relative to the plane containing said roughened annular portion and in the direction of

rotation of the shaft journaled by said seal element thereby to effect hydrodynamic pumping of oil to the oil side of said seal.

4,705,278

SELECTIVELY COMPRESSED EXPANDED GRAPHITE GASKET AND METHOD OF MAKING SAME

Robert F. Locacius, Lake Zurich, and Terence Zelenka, Chicago, both of Ill., assignors to Fel-Pro Incorporated, Skokie, Ill.

Filed Sep. 29, 1986, Ser. No. 912,593
Int. Cl.[4] F16J *15/12*
U.S. Cl. 277—235 B **23 Claims**

1. A laminated, selectively compressed, expanded graphite gasket assembly comprising:

a thin self-supporting core having a pair of main faces and generally coextensive compressed expanded graphite facings of generally uniform thickness, one laminated to each main face, said gasket assembly defining at least one opening therethrough,

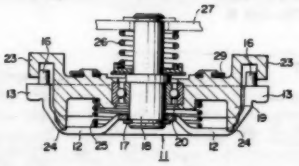
a flat protective thin metallic layer at least partially embedded in at least one of said facing and covering portions of said facing which are less than 75% of the surface area of said facing, whereby the density of said graphite facing in the covered portions is greater than the density outside the covered portions and the sealing stress of said gasket assembly in use is greater in the covered portions than outside the covered portions.

4,705,279

DEVICE FOR CLAMPING A FLEXIBLE DISK

Hidetada Mizukami; Tsutomu Urata; Takashi Nakagawa; Kunihiro Hashimoto, and Toshiaki Mizoguchi, all of Saitama, Japan, assignors to Ye Data Inc., Tokyo, Japan

Filed Jun. 25, 1986, Ser. No. 878,431
Int. Cl.[4] G11B *25/04*
U.S. Cl. 279—1 L **3 Claims**



1. A collet means for engagement with a spindle hub for centering and clamping an annular flexible disk on the spindle hub, said collet means comprising:

a collet having a plurality of radially extending petal-like portions therearound for centering the annular disk on the spindle hub when the collet means engages the spindle hub, each of said petal-like portions having a flange integral therewith for pressing a surface portion of the annular disk against the spindle hub to clamp the annular disk when the collet means engages the spindle hub, and each of said petal-like portions having a first stop portion integral therewith and extending therefrom;

a collet shaft on which said collet is mounted;

a regulating body on said collet and having stops thereon extending outside of said first stop portions of said petal-like portions and engagable by said first stop portions for

limiting the outward movement of said petal-like portions during an increase in the diameter of said collet; and

an enlarging spring on said regulating body and having legs thereon engaging said petal-like portions for urging said petal-like portions outwardly for increasing the diameter of said collet.

4,705,280

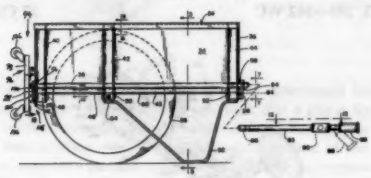
FOLDABLE UTILITY CART WITH AUXILIARY SUPPORT CARRIAGE

Richard H. Burns, 662 Clarendon Rd., Troy, Ohio 45373

Continuation-in-part of Ser. No. 788,323, Oct. 17, 1985, Pat. No. 4,624,467. This application Oct. 29, 1986, Ser. No. 924,863

Int. Cl.[4] B62B *1//12*

U.S. Cl. 280—40 12 Claims



1. In a foldable utility cart, the combination comprising:

(a) a hauling body including a floor having a pair of opposite lateral sides, a pair of opposite side panels and pivot means interconnecting and mounting said side panels to said floor at said respective opposite lateral sides thereof for pivotal movement of each of said side panels relative to said floor between an erected condition in which said side panels together with said floor form a load supporting cavity and a folded condition in which said side panels overlie said floor so as to eliminate said cavity, said hauling body being tiltable between upright hauling and upturned nonhauling positions irrespective of whether said side panels are disposed in their erected or folded conditions relative to said floor;

(b) wheels connected to said side panels of said hauling body so as to engage the ground and movably support said body when said side panels thereof are in their erected condition and said hauling body is in its upright hauling position, said wheels assuming a nonsupporting relationship with respect to the ground and said hauling body when said side panels are in their folded condition and said hauling body is in its upturned nonhauling position; and

(c) an auxiliary support carriage including a pair of wheel assemblies being mounted to said pivot means in stationary relation thereto and to side panels in pivotal relation thereto to allow said side panels to pivot relative to said wheel assemblies between their erected and folded conditions, said wheel assemblies being disposable at transport and stored positions respectively when said hauling body is tilted between its upturned nonhauling and upright hauling positions, said wheel assemblies when disposed at their transport position being engaged with the ground and supporting said hauling body freestanding without operator assistance in its upturned nonhauling position out of contact with the ground thereby facilitating conversion of said side panels of said hauling body between their erected and folded conditions and transport of said hauling body to and from a storage location, said wheel assemblies when disposed at their stored position being placed in a nonengaged relationship with the ground and a nonsupporting relationship with said hauling body, said mounting of said wheel assemblies in stationary relation to said pivot means and in pivotal relation to said side panels maintaining said wheel assemblies in a stationary relation to one another irrespective of whether said side panels are disposed in their erected or folded conditions relative to said floor.

4,705,281

CARRYING AID FOR SKIS

Stefi Spinas, Schloesslistrasse 17, CH-8044 Zürich, Switzerland

Filed May 16, 1986, Ser. No. 863,855

Claims priority, application Switzerland, Jun. 5, 1985, 2376/85

Int. Cl.[4] A63C *11/10*

U.S. Cl. 280—47.13 R 3 Claims

1. Carrying aid for a pair of skis, including a housing (10) which can be pushed onto the rear end of the pair of skis (4), which housing (10) has two side walls (11, 12) which contacts the surface (7) of the skis (4) and a floor element (16) which contacts the trailing ends of the skis (4), a strap (38) to hold the skis (4) in the housing (10), and a fork (28) which can be pivoted into the housing (10) about a first pivot axis (17) arranged perpendicular to the side walls (11, 12), in which fork a roller wheel (33) is rotatably mounted, characterized in that the floor element (16) can be pivoted about the first pivot axis (17) relative to the housing (10), that the fork (28) is mounted in the floor element (16) so as to rotate about a second pivot axis (31) which is perpendicular to the first pivot axis 17 and perpendicular to and spaced from the rotational axis (32) of the roller (33), that the floor element (16) includes a stop (18) and a lockable detent means (20) to lock the roller (33) in its outwardly pivoted position relative to the housing (10), that the second pivot axis (31) is arranged approximately in the center of the underside of the housing when the roller (33) is in its outwardly pivoted position, that the strap (38) includes a clamp lock (43) which is formed as a toggle catch, that the side walls (11, 12) of the housing (10) form a groove (37) projecting toward the interior of the housing which groove (37) is spaced from the floor element (16), and the strap (38) is guided in said groove (37), and that the clamp lock (43) includes a lever (45) which is pivotably mounted in the sides (46) of the groove (37) of one side wall (11) and has a buckle (42) for adjusting the length of the strap.

4,705,282

VEHICLE WITH READILY MOUNTABLE STEERING HANDLE

Robert C. Berfield, Jersey Shore, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.

Filed Oct. 16, 1986, Ser. No. 919,836

Int. Cl.[4] B62B *3/02*

U.S. Cl. 280—47.37 R 11 Claims

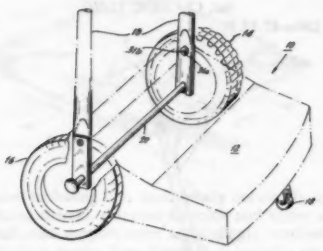
1. A vehicle with a handle for steering purposes that is mountable to a body of the vehicle, comprising:

a handle having first and second mounting sections situated

at respective lower ends of the handle; each mounting section having a pair of opposing transverse surfaces;

a vehicle body including a housing and transverse axle means for supporting the first and second mounting sections, respectively;

first and second elongated mounting brackets for engaging the first and second mounting sections, respectively; each bracket having a pair of generally flat opposing transverse surfaces, having at its lower end a respective aperture for



receiving therethrough the axle means and thereby being rotatable about the axle means and movable relative to the housing, and having at position above the aperture a configuration for fastening onto an upper end of a respective one of the first and second handle mounting sections; and

the first and second mounting sections each having a transverse lower edge with a notched portion therein for receiving the transverse axle means and being configured at a position above the notched portion for fastening onto a respective one of the mounting brackets.

4,705,283

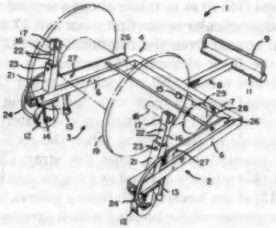
ELECTRICIANS WIRE SPOOL CARRIER

Stanley N. Kleisath, 13615 28th St., NE., Lake Stevens, Wash. 98258

Filed Mar. 15, 1985, Ser. No. 712,214

Int. Cl.[4] B62B *1/06*

U.S. Cl. 280—47.12 **8 Claims**



5. Apparatus for lifting, supporting and transporting wire spools and the like comprising;

frame means including substantially parallel support members forming an open-ended spool-carrying yoke,

said frame means including lifting handle means and support wheel means mounted on said support members adjacent the open end of said yoke,

spool support means comprising a pair of spool shaft receiving standards mounted respectively on said support members adjacent the open end of said yoke,

said standards being so constructed and arranged to carry and support a spool with the center of gravity thereof being located over a point intermediate the ends of the support members when the frame is in a lowered position, and

curvilinear rocker members connected intermediate the ends thereof to each of said support members at the open end of said yoke,

said rocker members having their opposite ends connected respectively to said standards and said support wheel means, whereby

said rocker bars support said frame means when in a raised position to engage said standards with a spool support shaft to provide a stationary fulcrum for initially lifting the spool.

4,705,284

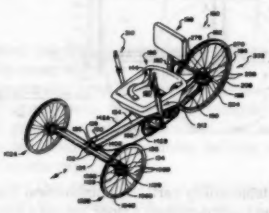
HUMAN POWERED LAND VEHICLE

W. Douglas Stout, Provo, Utah, assignor to Brigham Young University, Provo, Utah

Filed May 20, 1986, Ser. No. 865,168

Int. Cl.[4] B62R *5/08*

U.S. Cl. 280—242 WC **27 Claims**



1. A human powered land vehicle for carrying an operator, the operator having at least one movable arm, the vehicle comprising:

support means for supporting the body of the operator;

a driven wheel disposed at the rear of the vehicle;

a steered wheel disposed at the front of the vehicle;

two lever means comprising:

propulsion means for translating a reciprocating motion of at least one arm of the operator into unidirectional motion of the rear driven wheel so as to propel the vehicle;

steering means for directing the front steered wheel such that the vehicle may be guided in a left, right, or straight direction, and;

means for locking the two lever means in parallel, and;

frame means capable of carrying the support means, the driven wheel, the propulsion means, the steered wheel, the steering means, and the operator.

4,705,285

STABILIZER APPARATUS FOR TELESCOPIC TYPE FRONT FORK

Takao Yoshida, Kawaguchi, Japan, assignor to Honda, Tokyo, Japan

Filed Dec. 11, 1985, Ser. No. 807,635

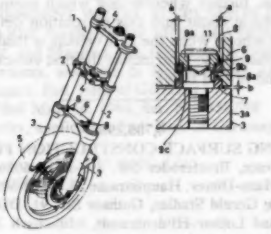
Claims priority, application Japan, Dec. 12, 1984, 59-188468[U]

Int. Cl.[4] B62K *19/24*

U.S. Cl. 280—279 **6 Claims**

1. A stabilizer apparatus for a telescopic type front fork having a pair of left and right movable fork members supporting a front wheel of a vehicle, said apparatus comprising: a stabilizer bar having an end connected to each of the fork members and resilient connection means positioned between each of the fork members and the corresponding end of the stabilizer bar for permitting lateral and vertical movement of the stabilizer br relative to the fork members by resilient deformation of said connection means; said connection means comprising plural resiliently deformable adjustment members, each shaped as a bushing mounted in and fixed to a connecting opening in an end portion of said stabilizer bar, and a bolt

fastening each said adjustment member to the movable fork member at an attaching base portion projecting from an upper end portion of the movable fork member, each bolt having a head inserted into the connecting opening wherein an annular gap is formed therebetween each adjustment member having a



lower end portion projecting slightly downward beyond a lower surface of the stabilizer bar such that a gap is formed in the vertical direction between the stabilizer bar and the attaching base portion whereby resilient deformation of the adjustment members permits lateral and vertical movement of the stabilizer bar relative to the fork members.

4,705,286

BICYCLE FRAME

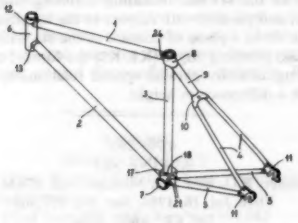
Rene Lauzier, Bourgoin Jallieu; Jean Rollin, Saint Etienne; Jean Choquelle, L'Horme; Gerard Dumas, St Just St Rambert; Francois Breat; Maurice Rousson, both of Saint Etienne, and Paule Defour, St. Priest en Jarez, all of France, assignors to Etablissements Lauzier, Bourgoin Jallieu; Ateliers de la Rive, Saint Chamond; Bador S.A. and Angenieux-CLB S.A., both of Saint Etienne, all of, France

Filed Dec. 23, 1986, Ser. No. 946,453

Claims priority, application France, Dec. 23, 1985, 85 19550

Int. Cl.[4] B62K *19/22;* **F16B** *7/02*

U.S. Cl. 280—281 R **8 Claims**



6. A bicycle frame comprising:

a top tube having front and rear ends;

a down tube having upper and lower ends;

a seat tube having upper and lower ends;

two seat stays having upper and lower ends;

two chain stays having front and rear ends;

a head-tube fitting having pins fitted into the front end of the top tube and the upper end of the down tube;

a front sprocket fitting having pins fitted into the lower ends of the down and seat tubes and into the front ends of the chain stays;

respective rear sprocket fittings having pins fitting into the rear ends of the chain stays and into the lower ends of the seat stays:

a seat fitting having a pin fitted into the rear end of the top tube and another pin;

means connecting the other pin to the upper ends of the seat stays,

each pin extending along a respective axis and having

an outer surface portion of axially constant section centered on the axis and engaged in the respective tube end,

an inner surface portion centered on the axis and flaring axially inward away from the inner end of the respective outer surface portion, and

a shoulder surface projecting generally perpendicular from the inner end of the inner surface portion and facing outward;

each tube end has an end surface abutting flatly on the respective shoulder surface and an inner surface having an inner surface portion fitted tightly over and complementary to the inner surface portion of the respective pin and an outer surface portion radially slightly spaced from and facing the outer surface portion of the respective pin; and

respective bodies of adhesive generally filling between the outer surface portions of each pin and the respective tube and adhering same together.

4,705,287

TRAY SUPPORT FOR WHEELCHAIR

Carlyen F. Cumbie, 1169 Cole Dr., Lilburn, Ga. 30247

Filed Dec. 22, 1986, Ser. No. 944,575

Int. Cl.[4] A47B *83/02*

U.S. Cl. 280—289 WC **4 Claims**

1. A wheelchair including a seat, a pair of arm rests generally parallel and adjacent to said seat at opposite sides thereof, in combination with a tray support including an arm selectively disposable adjacent to the front edge of said seat of said wheelchair, and a tray gripping member carried by said arm, said tray gripping member comprising a lower flange for receiving the edge of a tray thereon, and a lip partially overlying said lower flange for limiting motion of said edge of said tray, the arrangement being such that said tray is readily received within said tray gripping member and is readily removable therefrom, said wheelchair including at least one generally vertical support for at least one of said arm rests, a clamping device fixed to said vertical support, said arm being pivotally carried by said clamping device, a groove in said clamping device for defining a locked position of said arm so that said gripping member is disposed at the front of said seat of said wheelchair.

4,705,288

LOAD DISTRIBUTOR WITH ARTICULATED GROUND SUPPORT

Kenneth J. Schmidt, Springfield, Oreg., assignor to General Trailer Co., Springfield, Oreg.

Filed Dec. 16, 1985, Ser. No. 809,241

Int. Cl.[4] B60D *21/14, 53/00*

U.S. Cl. 280—405 R **5 Claims**

1. An axle load-distributing apparatus attachable to a load-carrying frame in a vehicle comprising:

an auxiliary frame including multiple mounting points;

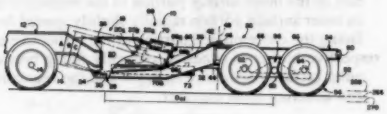
attachment means located at an end of the load-carrying frame for securing said auxiliary frame to the load-carrying frame, wherein said attachment means includes a detachable bracket fixed to the load-carrying frame, and

said auxiliary frame is fixed to said bracket at a pivot point allowing vertical movement only of said auxiliary frame relative to the load-carrying frame, said bracket including corresponding multiple mounting points;

a load-distributing axle, having wheels thereon, mounted on said auxiliary frame for supporting a portion of the weight of the load carried on the load-carrying frame;

articulation means for allowing articulation of said load-distributing axle relative to said load-carrying frame; and

load distribution means operable to distribute said portion of the weight to said load-distributing axle, said load-distributing means being located intermediate said attachment means and said articulation means, wherein said load-distributing means includes powered extensible ram means having one end mounted on said bracket and the other end mounted on said auxiliary frame, and wherein said one end of said ram means is secured to a mounting point on said bracket and the other end of said ram means is secured to a corresponding mounting point on said auxiliary frame, and said ram means is shiftable between corresponding mounting points for varying, within a known range, the portion of the weight distributed to said load-distributing axle.



4,705,289

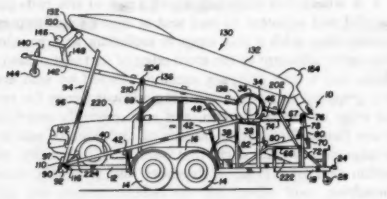
DUAL LOAD TRAILER

Robert W. Weber, P.O. Box 193, Hamilton, Tex. 76531

Filed Mar. 3, 1986, Ser. No. 837,378

Int. Cl.[4] B60P *3/08*

U.S. Cl. 280—414.1 **22 Claims**



1. A dual load trailer for simultaneously transporting a first vehicle having a pair of laterally spaced vehicle wheels defining a transverse axis of rotation and a second vehicle, comprising:

(a) a rigid frame having a front end and a back end;

(b) a trailer coupling means mounted on said front end of said frame;

(c) at least one axle mounted on said frame, each of said at least one axle having at least one wheel axially mounted on either end thereof for supporting the trailer and the first and the second vehicles when loaded thereon;

(d) a lower platform mounted on said frame for supporting the second vehicle thereon;

(e) an upper platform mounted on said frame above said lower platform and the second vehicle when supported on said lower platform, said upper platform for supporting the first vehicle thereon with the first vehicle facing said front end of said frame;

(f) ramp means mounted on said frame for loading and unloading the first vehicle from said upper platform and the second vehicle from said lower platform;

(g) means for securing the first vehicle on said upper platform and for securing the second vehicle on said lower platform; and

(h) winch means mounted on said frame and including a cable for connection to the first vehicle and to the second vehicle for loading and unloading the first vehicle onto said upper platform and a second vehicle onto said lower platform, further wherein said winch means rotates the first vehicle about said axis of rotation defined by said vehicle wheels when the first vehicle is loaded onto said upper platform so as to incline the first vehicle toward the front end of said frame.

4,705,290

RUNNING SURFACE CONSTRUCTION FOR SKIS

Matthias Gratz, Brotteroder Str. 19, DDR-6086Pappenheim; Schmalz Hans-Dieter, Hauptstrasse 53, DDR-6081 Mittelschmalkalden; Gerald Stadler, Gothaer Str. 91, DDR-6087 Seligenthal, and Lothar Hildenbrandt, Mühebach 2, DDR-6086 Pappenheim, all of German Democratic Rep.

Continuation of Ser. No. 750,631, Jul. 1, 1985, abandoned. This application Mar. 6, 1987, Ser. No. 22,477

Claims priority, application German Democratic Rep., Jul. 24, 1984, 2655698

Int. Cl.[4] A63C *5/044*

U.S. Cl. 280—604 **14 Claims**

1. Running surface for a cross-country ski comprising a profiling arranged in a middle longitudinal region of the ski, said profiling comprising rows of edge profiles extending over the width of the ski and including climbing edges directed transverse, and parallel with respect to the longitudinal direction of the ski in a plane of contact of the ski with the snow, wherein said climbing edges (K1, K2) are formed on a gliding arch in longitudinally parallel spaced relationship with each other with a difference in height.

4,705,291

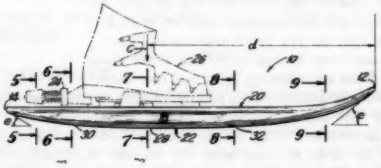
ALPINE SKI

Richard Gauer, P.O. Box 298, McAfee, N.J. 07428

Filed Jul. 18, 1986, Ser. No. 887,905

Int. Cl.[4] A63C *5/04*

U.S. Cl. 280—609 **16 Claims**



1. A substantially rigid ski having opposed front and rear ends, opposed top and bottom surfaces and opposed sides, said bottom surface of said ski being generally convex from the front to the rear and being generally convex from side to side, such that at any location along the length of the ski the minimum top to bottom thickness of the ski is adjacent the sides, said side to side convex configuration defining two areas of

maximum side to side convexity at locations on said bottom surface spaced from each other and spaced from said front and rear ends of said ski and defining an area of lesser side to side convexity on said bottom surface between said areas of maximum side to side convexity.

4,705,292

INDEPENDENT WHEEL SUSPENSION FOR STEERABLE WHEELS OF MOTOR VEHICLES

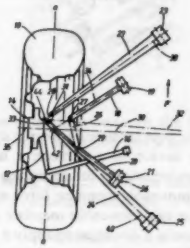
Achim Hespelt, and Manfred v. d. Ohe, both of Stuttgart, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 14, 1986, Ser. No. 839,598

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1985, 3509145

Int. Cl.[4] B60G *3/20*

U.S. Cl. 280—660 **5 Claims**



1. Independent wheel suspension for steerable wheels having a wheel bearer connected to the vehicle body by upper and lower guide wheel means,

wherein said upper guide wheel means comprises separate upper guide link means coupled at articulated points to the vehicle body and the wheel bearer; and an upper coupler means connected between the wheel bearer articulated points and angled rearwardly and inwardly from said wheel, and

wherein said lower guide wheel means comprises separate lower guide link means coupled at articulated points to the vehicle body and the wheel bearer; and a lower coupler means connected between the wheel bearer articulated points and angled forwardly and inwardly from the wheel.

4,705,293

GOLF TROLLEYS

Ian J. Hart, Four Gables, Hillcliffe Lane, Turnditch, Derbyshire, United Kingdom

Filed Nov. 25, 1985, Ser. No. 801,542

Claims priority, application United Kingdom, Nov. 27, 1984, 8429890

Int. Cl.[4] B62B *3/02*

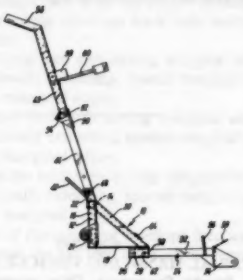
U.S. Cl. 280—641 **13 Claims**

1. A collapsible frame assembly for an electrically powered golf trolley having a pair of main wheels mounted on an axle, a forward wheel, an electric motor, a gear box, and a battery, said frame assembly comprising:

(a) a subframe including a vertically extending, rectangular rear frame, a pair of strip members, each secured at one end to an opposite corner of the lower portion of said rear frame and secured together at their opposite ends to form a base portion having a triangular configuration with the apex of the triangle pointing towards the front of the trolley, an inclined bracing member extending from the apex of the base portion to a substantially central location along the top of said rear frame, and wheel bearings secured to said rear frame for supporting said wheel axle;

(b) an extension member pivotally mounted at one end to the underside of the base portion at its apex for movement between a horizontal position extending forwardly of the subframe and a folded position extending horizontally below the subframe, said extension member having at its opposite end a wheel mounting for supporting said forward wheel; and

(c) an elongated handle including a lower handle section pivotally mounted at a substantially central location along



the top of said rear frame, an upper handle section pivotally secured to said lower handle section, and a hand grip secured to the top of said upper handle section;

wherein said trolley may be collapsed by pivoting said lower handle section forwardly to a location parallel with said inclined bracing member while also pivoting said upper handle section to a location parallel to and above said lower handle section and by pivoting said extension member to a location parallel to and below said base portion.

4,705,294

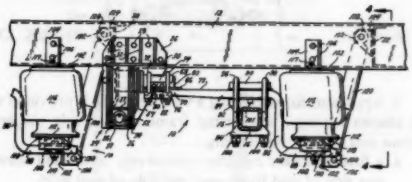
AIR SUSPENSION ASSEMBLY WITH UNIVERSAL PIVOTED HANGER BEARINGS AND RIGID MOUNT ANGULAR TORQUE SPRING-BEAM

John E. Raidel, Rte. 1, Box 400-M, Springfield, Mo. 65804

Filed Jul. 3, 1986, Ser. No. 881,962

Int. Cl.[4] B60G *11/26*

U.S. Cl. 280—711 **8 Claims**



1. A vehicle suspension system for a vehicle having left and right chassis frame members and axle means below the frame members, comprising left and right step springs, each step spring comprising a unitary spring steel member having a forward generally horizontal section having a leading end, a rearward generally horizontal section having a trailing end, a generally vertical section between and contiguous with the forward and rearward sections and displacing the rearward section below the forward section, left and right hangers depending respectively from the left and right frame members, left and right first bushings supported respectively by the left and right hangers, left and right arms respectively mounted on the left and right first bushings for limited revolution about transverse axes as permitted by the first bushings, left and right second bushings supported respectively by the left and right

arms, each left and right second bushings including a central shaft means for mounting the leading ends of the left and right step springs respectively on the central shaft of the left and right second bushings for limited rotation about longitudinal axes as permitted by the second bushings, means to connect the axle means to the step springs intermediate the ends thereof, and left and right air spring means respectively mounted between the left and right chassis frame members and the trailing ends of the left and right step springs.

4,705,295

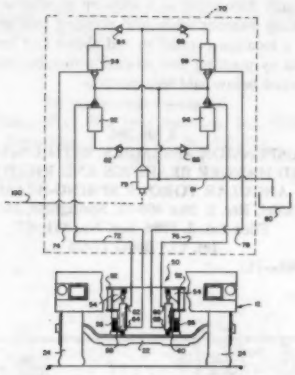
MATERIAL HANDLING VEHICLE STABILIZER

Gerald E. Fought, Sugarcreek, Ohio, assignor to The Gradall Company, New Philadelphia, Ohio

Filed Dec. 11, 1985, Ser. No. 807,617

Int. Cl.[4] B66C *23/62*

U.S. Cl. 280—754 **27 Claims**



1. Apparatus for stabilizing a vehicle which is provided with a chassis having a supporting frame and an axle suspended from said chassis, comprising:

a. a first hydraulic cylinder operatively connected between one side of said frame and one side of said axle;

b. a second hydraulic cylinder operatively connected between the other side of said frame and the other side of said axle;

c. a pneumatically operated lockout means for sealing hydraulic fluid in all of the chambers of said first and said second hydraulic cylinders upon receipt of a first pneumatic signal and for allowing fluid communication between all of the chambers of said first and second hydraulic cylinders upon the cessation of receipt of said first pneumatic signal;

d. travel control means for hydraulically powering the movement of said vehicle; and

e. means coupled to said travel control means for generating said first pneumatic signal when said vehicle is stationary and prohibiting said first pneumatic signal during movement of said vehicle.

4,705,296

SEAT BELT PRE-TENSIONING DEVICE

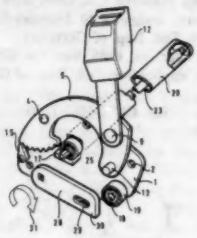
Sture R. Andersson, Nacka; Lars Y. Haland, Falsterbo, and Bengt O. J. S. Mörner, Hovas, all of Sweden, assignors to Autoliv Development AB, Vargarda, Sweden

Filed Feb. 20, 1986, Ser. No. 831,523

Claims priority, application United Kingdom, Feb. 21, 1985, 8504452; Jan. 9, 1986, 8600469

Int. Cl.[4] B60R *21/10*

U.S. Cl. 280—806 **13 Claims**



1. A vehicle seat belt tensioning device comprising: means for mounting the device in a vehicle; a moveable member mounted on the device, means for receiving part of a seat belt connected to said moveable member; force applying means for applying a force to said moveable member to move said seat belt receiving means in a direction to apply a tension to the seat belt; and means for normally preventing said force applying means from moving said seata belt receiving means, but which are responsive to a predetermined deceleration for actuating said force applying means to permit the force applying means to apply their force to move said seat belt receiving means; and wherein said means for preventing includes a stop which is engaged by part of said moveable member, and said stop is formed on an element which is adapted to move by its own inertia relative to the rest of the device, when the device is subject to a predetermined accelerational or decelerational force, thus disengaging the stop from said part of said member.

4,705,297

BUSINESS FORM ASSEMBLY WITH LEADERS

William R. Wakeman, Ransomville, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Jan. 24, 1986, Ser. No. 822,157

Int. Cl.[4] B42D *1/00, 19/00*; B41L *1/20*; B65D *27/10*

U.S. Cl. 281—2 **4 Claims**

1. A continuous business form assembly comprising:

a longitudinally continuously extending carrier web having a longitudinally extending series of carrier form stubs; and

a longitudinally extending series of form sets attached to the form stubs by fastening means;

a longitudinally extending series of spacer sheets alternating with the form stubs;

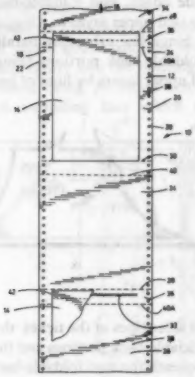
each form stub extending between a first transversely extending fold perforation line and a second transversely extending fold perforation line;

each form set having a first tear-off perforation line substantially parallel to the first transversely extending fold perforation line;

the fastening means located between the first tear-off perforation line and the first transversely extending fold perforation line;

each spacer sheet extending between the second transversely extending fold perforation line and the first transversely extending fold perforation line of a following form stub;

each form stub conforming a stub portion and a backing sheet;



each stub portion extending between the first transversely extending fold perforation line and a second tear-off perforation line;

the stub portion being shorter than the backing sheet.

4,705,298

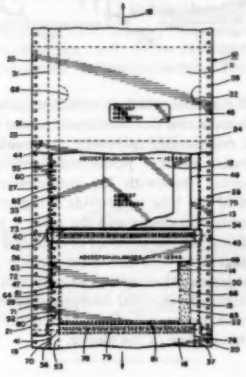
DIE CUT WINDOW MAILER WITH SELF-IMAGING SHEET

Edmund G. Van Malderghem, Lewiston; Dominick L. Monico, Amherst, and Michael W. Anderson, West Seneca, all of N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Continuation of Ser. No. 606,640, May 3, 1984, abandoned. This application Jun. 6, 1986, Ser. No. 873,102

Int. Cl.[4] **B41L** *1/20, 5/04;* **B65D** *27/10, 27/06*

U.S. Cl. 282—11.5 A **3 Claims**



1. A continuous business form assembly adapted to be processed through high speed machinery including an impact printer, and to provide custom addressed, outgoing envelopes filled with contents including return envelopes, the assembly comprising:

a continuous outgoing envelope face web defining windows therein;

a self-imaging web positioned behind the outgoing envelope face web and the windows thereof adapted to provide custom addresses on itself visible through the windows when impacted with custom address information by an impact printer;

a return envelope face web positioned behind the self-imaging web;

a return envelope back web behind the self-imaging web; and

a continuous outgoing envelope back web positioned behind the self-imaging web;

the outgoing envelope face web, the return envelope back web and the outgoing envelope back web having equal transverse widths;

the outgoing envelope face web having marginal edges and having longitudinally extending, spaced marginal pin feed holes along the marginal edges;

the return envelope back web having marginal edges and having longitudinally extending, spaced marginal pin feed holes along the marginal edges;

the outgoing envelope back web having marginal edges and having longitudinally extending, spaced marginal pin feed holes along the marginal edges;

the pin feed holes of the outgoing envelope face web being superimposed over the pin feed holes of the return envelope back web;

the pin feed holes of the return envelope back web being superimposed over the pin feed holes of the outgoing evelope back web;

the outgoing envelope face web and the outgoing envelope back web adhered together to form a plurality of outgoing envelopes;

the return envelope face web and the return envelope back web having feed strips and being carrier webs for the assembly and being adhered together to form a plurality of return envelopes within the outgoing envelopes;

whereby the custom addressed, outgoing envelopes filled with contents including return envelopes are provided, without reliance upon a flysheet.

4,705,299

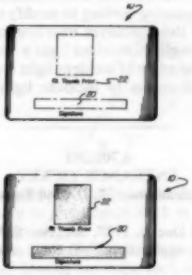
PLASTIC IDENTITY CARD CAPABLE OF PROVIDING AN INKLESS FINGERPRINT AND METHOD OF DEVELOPING INKLESS PRINTS ON PLASTIC CARD

Virgil Hedgcoth, Pomona, and Douglas C. Arndt, Thousand Oaks, both of Calif., assignors to Identicator Corp., San Bruno, Calif.

Filed May 27, 1986, Ser. No. 867,058

Int. Cl.[4] **B42D** *15/00;* **A61B** *5/10*

U.S. Cl. 283—68 **16 Claims**



1. In a method of developing inkless fingerprints on a nonporous plastic identity card the steps of:

mixing a liquid reagent with a chemical compound capable of providing an adherent ink absorbent coating on the plastic card;

applying the mixture of reagent and chemical compound over or section of the card of sufficient size to receive a

fingerprint to provide a porous ink receptive coating over said section;

applying a substantially colorless liquid developer solution to a finger of a person whose print is desired on the card; and

pressing the finger with developer solution thereon over the porous coating, the liquid reagent and developer solution chemically interacting to provide a perceivable colorant product representative of the fingerprint ridge pattern.

4,705,300

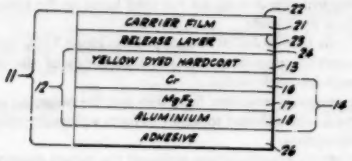
THIN FILM OPTICALLY VARIABLE ARTICLE AND METHOD HAVING GOLD TO GREEN COLOR SHIFT FOR CURRENCY AUTHENTICATION

Peter H. Berning, Sebastopol, and Roger W. Phillips, Santa Rosa, both of Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Continuation of Ser. No. 640,141, Jul. 13, 1984, abandoned. This application Nov. 21, 1986, Ser. No. 935,065

Int. Cl.[4] B42D *15/00*; **G06R** *9/74*

U.S. Cl. 283—91 **8 Claims**



1. In a thin film optical variable article to be used in a reflection mode having a gold to green color shift with angle for currency authentication and adapted to be carried by a substantially opaque currency sheet which serves as a substrate, the article comprising a substantially transparent, optically thick element carrying a subtractive colorant means and having first and second surfaces and a multilayer interference coating carried on one of said first and second surfaces and having an inherent color shift with angle, said article being adapted to be carried by the currency sheet so that the coating faces the currency sheet and the subtractive colorant carrying element serves as a superstrate facing the incident light, said multilayer interference coating being comprised of a substantially opaque layer of aluminum nearest the substrate, followed by a layer of magnesium fluoride, and then by a layer of chromium having substantial transmission, said subtractive colorant means having a yellow hue and in combination with the multilayer interference coating serving to modify the inherent color shift produced by the multilayer interference coating to provide at a normal angle of incident light a coppery-gold color and at a non-normal angle of incident light a vivid green and at higher non-normal angles of incident light substantially no color.

4,705,301

ENTRANCE TICKET

Bernhard Dojel, Sulenstrasse 37, D-4240 Emmerich 5, Fed. Rep. of Germany

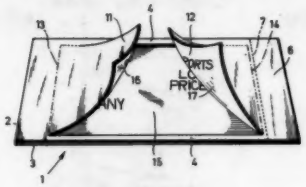
Filed Dec. 6, 1985, Ser. No. 805,712

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1984, 8435844

Int. Cl.[4] B42D *15/00*; **B41L** *5/00*

U.S. Cl. 283—105 **3 Claims**

1. An entrance ticket comprising a rectangular, flexible print-carrier made of paper-like material, and having ends and side edges, said print carrier comprising upper and lower flexible layers of similar outline having central and peripheral regions and connected together permanently in the peripheral regions thereof, and said upper layer carrying ticket indicia and having in the central region thereof two foldable-back portions, said portions being detachably connected to one another along a central line of perforations extending perpendicular to said side edges, said foldable-back portions being each connected to said upper layer in a hinged manner along a respective crease hinge line extending parallel to said ends of the ticket, said foldable-back portions being each connected detachably to said upper layers by lines of perforations extending parallel to said side edges of the ticket, the lower surface of each of the two foldable-back portions and the upper surface of the lower layer beneath the two foldable-back portions carrying indicia such as advertising or other information, whereby the two foldable-back portions may be folded back in diametrically opposite directions, with at least one portion being folded back away from said second layer.



4,705,302

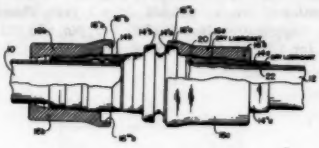
TUBE FITTING

Mark J. Beiley, Lomita, Calif., assignor to Teledyne Linair Engineering, Gardena, Calif.

Filed May 28, 1986, Ser. No. 867,544

Int. Cl.[4] F16L *11/12*

U.S. Cl. 285—47 **6 Claims**



1. A fitting for an electrically conductive tube comprising: an electrically conductive sleeve extending over the end of the tube in coaxial relationship therewith; an annular electrically conductive tubular member positioned over said sleeve in coaxial relationship therewith for compressing the sleeve against the end of the tube to provide a high-strength fluid-tight joint between the sleeve and the tube, a portion of the inner surface of said tubular member at each end thereof being in intimate engagement with the outer surface of said sleeve and in electrical contact therewith; and a layer of dry lubricant of electically insulating material interposed between an intermediate portion of the inner surface of the outer tubular member and the outer surface of the sleeve.

4,705,303

DETACHABLE HOSE COUPLING

Joan J. A. M. van Aspert, Berlicum, Netherlands, assignor to Askove Kunststof Industrie B.V., Netherlands

Filed Jul. 10, 1986, Ser. No. 883,981

Claims priority, application Netherlands, Jul. 10, 1985, 8501972

Int. Cl.[4] F16L *37/00*

U.S. Cl. 285—309 **9 Claims**

1. A coupling for rapidly and detachably connecting a conduit pipe or hose to an opening comprising:

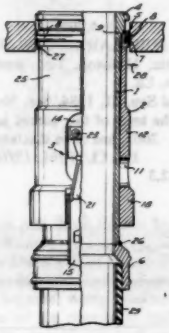
an inner sleeve having a flange on at least one end; and

an outer sleeve capable of moving with little play about the inner sleeve; and

a flexible sealing ring between the outer sleeve and the opening to be connected; and

clamping means for clamping the relative axial movement of inner and outer sleeve and for indirectly pressing the sealing ring tightly into the opening; and

the inner sleeve being provided near the flange with an inclination ascending face which mates with a corresponding ascending face at the outer sleeve, the outer sleeve being furnished with a groove arranged all around it for accommodating the sealing ring, while at least the part of the outer sleeve in the zone of the groove for the sealing ring is capable of flexible radial expansion in such a way that, upon the ascending face of the outer sleeve being pressed against the ascending face at the inner sleeve under the action of the clamping means, the sealing ring is thrust out radially and pressed tightly into the opening.



4,705,304

HOSE COUPLER FOR SPIRAL WIRE REINFORCED HOSES

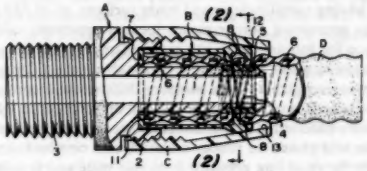
Tatsuya Matsuda, 2217, Uwano, Nyuzen-machi, Shimonikawa-gun, Toyama-ken, and Akira Nakagawa, 32, Nakasoide, Kamiichi-machi, Nakaniikawa-gun, Toyama-ken, both of Japan

Filed Jan. 17, 1986, Ser. No. 819,615

Claims priority, application Japan, Nov. 13, 1985, 60-255723

Int. Cl.[4] F16L *33/23*

U.S. Cl. 285—243 **8 Claims**



1. A hose coupling for attachment to the end portion of a hose which contains a reinforcing wire that is spirally wrapped along the length thereof and provides an undulating surface to at least one of the inside and outside surfaces of said hose, said hose coupling comprising

an elongated main body element which has opposite first and second ends, said first end including a connector portion which is threaded so that it can be attached to another hose coupling, and said second end including an axially-extending nipple portion which is insertable in the end portion of said hose,

a seal means provided around the outer surface of said nipple portion, said seal means extending in the axial direction of said elongated main body element a distance at least equal to the pitch of one revolution of said spirally-wrapped reinforcing wire of said hose,

a cylindrical sleeve which is positionable over the end portion of said hose when the end portion of said hose is positioned around said nipple portion of said elongated main body element, said cylindrical sleeve having a forward end which extends towards the connector portion of said elongated body element, a rearward end which extends away from the connector portion of said elongated body element, an outer surface and an inner surface, said inner surface providing a helical projection which extends radially inwardly of said cylindrical sleeve and is located along the length thereof to project towards said seal means, and

a back nut which is positionable over said cylindrical sleeve and includes a leading end which is connectable with said elongated main body element, a trailing end, an outer surface, and an inner surface, said inner surface tapering towards said trailing end such that, when said leading end is connected to said elongated main body element, said inner surface thereof will contact the rearward end of said cylindrical sleeve and move the helical projection on the inner surface of said cylindrical sleeve towards said seal means located around the outer surface of the nozzle portion of said elongated main body element, thus securely clamping the end portion of said hose positioned between the nozzle portion and the cylindrical sleeve.

4,705,305

COUPLING AND CLAMPING DEVICE

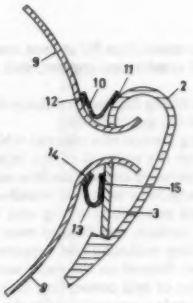
Azmy W. Ghaly, 1648 Timbertrail, Wheaton, Ill. 60187

Filed Jun. 22, 1984, Ser. No. 623,441

The portion of the term of this patent subsequent to Jan. 10, 2004, has been disclaimed.

Int. Cl.[4] F16L *37/20*

U.S. Cl. 285—311 **3 Claims**



1. A quick clamp or coupling with toggle action for tightening in the clamp to join objects such as tubes or shafts in axial alignment comprising:

(a) a circular shaped band, cross-sectionally rectangular in width and having wo ends, each end formed into a rigid outwardly opening eye shape and said band having at its outer mid-portion an outwardly projecting weld stud or screw;

(b) a curved handle-lever of rigid material having a curved depression across the width of the inside surface thereof, said handle-lever having a free end with a longitudinal slot and the other end formed into an inwardly opening eye pivotally engaging in one of the outwardly opening eye

ends of said band; a flexible rubber hinge piece adhesively attached to said band and handle-levered engaged ends to hold them together and allow relative pivotal motion therebetween;

(c) a third member of rigid material having two ends, one of its ends pivotally engaging in the other outwardly opening eye end of said band; a flexible rubber hinge piece adhesively attached to said band and third member engaged ends to hold them together and allow relative pivotal motion therebetween; the other end of said third member being pivotally engaged in said curved depression, so that when the handle lever is rotated towards and against the clamp, said third member urges the band ends together and tightens said clamp, the weld stud projects through said longitudinal slot and said handle-lever is secured by a wing nut on said stud thereby locking all parts of the clamp together.

4,705,306

INJECTION LINE CONNECTION

Jurgen Guido, Borsig-Strasse 4, D-8402 Neutraubling, and Norbert Binzer, Neutraubling, both of Fed. Rep. of Germany, assignors to Jurgen Guido, Fed. Rep. of Germany

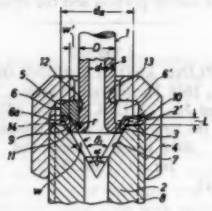
PCT No. PCT/DE84/00092, § 371 Date Dec. 14, 1984, § 102(e) Date Dec. 14, 1984, PCT Pub. No. WO84/04566, PCT Pub. Date Nov. 22, 1984

PCT Filed Apr. 18, 1984, Ser. No. 694,399

Claims priority, application Fed. Rep. of Germany, May 9, 1983, 3316979

Int. Cl.[4] F16L *19/04*

U.S. Cl. 285—332 7 Claims



1. A pressure connection for at least one end of an injection line for internal combustion engines, said pressure connection comprising:

a connection fitting formed as a flanged-over portion of the free end of the injection line;

a pressure ring formed of a material which is harder and less flexible than the material of the injection line, said ring having a rearward contact surface and a forward annular support projection which is rounded off at its free end toward said connecting fitting and has a tapered outer peripheral surface, said flanged-over portion of said connecting fitting enclosing said support projection;

a sealing taper formed on the outer surface of said flanged-over portion of said connecting fitting, said sealing taper having an angle corresponding to the angle of said tapered outer peripheral surface;

annular abutment means extending outwardly on said ring and engaging the free end of said flanged-over portion of the injection line in abutting relationship;

a connecting member having external threads and an internal taper for sealingly engaging said sealing taper formed on the outer surface of said flanged-over portion;

a cap nut having internal threads engageable with said external threads on said connecting member and having an inner annular shoulder for contacting said rearward contact surface of said ring;

whereby said cap nut is threaded onto said connecting member and tightened down, said connecting member positively and sealingly engages the sealing taper of the flanged-over portion of said connecting fitting, said ring and flanged-over end are forced together with said free end of the injection line being deformed toward said annular abutment means to thereby suddenly increase the resistance against a further tightening rotation of said cap nut when said free end abuts said annular abutment.

4,705,307

TUBULAR GOODS JOINT

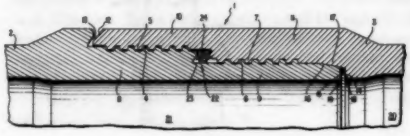
K. Darrel Chelette, Houston, Tex., assignor to James B. N. Morris, Gretna, La.

Filed Sep. 21, 1984, Ser. No. 652,973

The portion of the term of this patent subsequent to May 27, 2003, has been disclaimed.

Int. Cl.[4] F16L *15/00*

U.S. Cl. 285—332.3 29 Claims



1. A joint for coaxially interconnecting a pair of tubular goods, said joint comprising coaxial male and female members respectively including interengagable external and internal first threads, and interengagable external and internal second threads, said first threads on said male member being adjacent the free terminal forward end of said male member and being of smaller outer diameter than said second threads, said first threads and said second threads having substantially the same pitch and outline characteristics, said male member being screwable about its axis longitudinally forwardly into said female member, metal-to-metal seating surfaces on said male and female members, said surfaces in interengagement when undamaged and the joint made up, an annular male member shoulder providing a stepped portion on said male member between said first threads and said second threads, an annular female member shoulder providing a stepped portion on said female member between said first threads and said second threads, said threads having lands and roots, one of said shoulders being proximate with a ring receiving means for receiving an annular ring, an annularly continuous ring of resilient plastic or rubber material received in said ring receiving means, said ring having radially outer and inner surfaces, an in situ sealing flange generating corner means located proximate said outer surface for forming an in situ sealing flange on said ring upon exposure to assembly pressure, said in situ sealing flange being pressure energizable by a pressure differential thereacross to provide sealing of said joint in a given direction even when the pressure differential in that direction exceeds the yield pressure of the said plastic or rubber material, said ring including face means for receiving pressure from said male and female members upon make up of said joint and transmitting pressure to said corner means to cause said in situ sealing flange to form, said ring receiving means being radially located at least about as far from the tubular goods axis as the male member first thread roots, and first means associated with at least one of said shoulders for providing room for said in situ sealing flange to form and extend beyond said face means,

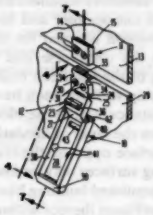
a second in situ sealing flange generating corner means is located on said ring between said inner and outer surface and second means are associated with each of said shoulders for providing room for said in situ sealing flange to form and extend beyond said face means.

4,705,308

DRAW PULL LATCH

Robert H. Bisbing, Delaware, Pa., assignor to Southco, Inc., Concordville, Pa.

Filed May 7, 1986, Ser. No. 860,450
Int. Cl.[4] E05C *19/14*
U.S. Cl. 292—108 8 Claims



1. An over-center draw pull latch for use in securing two members together, comprising:

(a) a keeper adapted for being affixed to one of the members;

(b) a one-piece part having base, locking and intermediate segments, said base segment being adapted for being affixed to another one of the members, said intermediate segment being flexibly connected to said base and locking segments for pivotal movement of said segments about transverse axes, and when in a locked condition said intermediate segment being disposed in substantially coplanar relation to said base segment and said locking segment being disposed in overlying relation to said base and intermediate segments and to said keeper, said locking segment being detachably connected to said keeper, and the flexible connection between said intermediate and locking segments being closer to said another one of the members than the flexible connection between said intermediate and base segments when in the locked condition, thereby comprising over-center means;

(c) a catch member having a long portion and a short portion disposed at generally right angles to one another, said long portion having a mounting region remote from said short portion, said mounting region being adapted for being positioned between said base segment and said another one of the members when said one-piece part is affixed to said another one of the members, said base segment being adapted to receive said mounting region of said catch member and to retain said long portion substantially adjacent to said another one of the members, said short portion having a barbed projection at an end remote from said long portion, said short portion being disposed to pass through said intermediate and locking segments when the latch is in a locked condition, said intermediate segment having an aperture therein positioned and sized so as to permit the passage of said short portion when said latch is moved to said locked condition, said locking segment having an aperture positioned and sized so as to contact said barbed projection when said latch is moved to said locked condition and to contact said barbed projection when in the locked condition whereby said locking segment is retained in said condition by said catch member, wherein said short portion is resiliently movable away from said locking segment to disengage sid barbed projection whereby said locking segment can be manually lifted to an unlocked condition; and

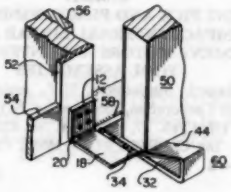
(d) wherein upon movement of said short portion away from said locking segment, said long portion of said catch member flexes outwardly towards said base segment, wherein said base segment is adapted to receive said long portion when said long portion is in the flexed condition, wherein said apertures in said intermediate and locking segments are sized so as to provide clearance for the movement of said short portion, and wherein the disengagement of said barbed projection is without mechanical affect on the connection between said locking segment and said keeper.

4,705,309

DOORWAY SECURITY SYSTEM

Ronald R. Sawchuk, 115, 601 - 10th Ave. S.W., Calgary, Alberta, Canada T2R 0B2

Filed Nov. 17, 1986, Ser. No. 931,055
Claims priority, application Canada, Nov. 20, 1985, 495809
Int. Cl.[4] E05C *3/02*
U.S. Cl. 292—342 5 Claims



1. A door security device for mounting adjacent a door comprising:

base plate means adapted to be secured to the frame of a door adjacent a floor;

wedge means pivotally associated with said base plate means through two hinge means which hinge means are planar and perpendicularly oriented with respect to each other such that said wedge means may be pivoted between an operative position for wedging action with a partially open door and a stored position adjacent the door opening and substantially off the floor.

4,705,310

WASTE COLLECTION DEVICE

Robert D. Scripter, 3034 S. 38th St., Ste. 2, Phoenix, Ariz. 85040

Filed Jul. 11, 1986, Ser. No. 884,612
Int. Cl.[4] A01K *29/00*
U.S. Cl. 294—1.4 6 Claims

1. A waste collection apparatus for use with a dispoxable, flexible receptacle having an opening defined by an edge, said apparatus comprising:

(a) an elongate handle having a lower end defining an axially extending recess therein;

(b) a holder having a base and sides and defining a frame for

receiving said receptacle therein, said holder including an integrally formed extension detachably and frictionally securable in said recess wherein said holder may be manually used independent of said elongate handle with the user grasping said extension; and

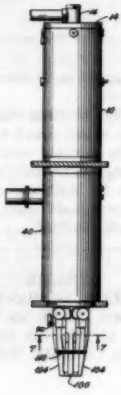
(c) fastener means tethered to said handle by flexible attachment means wherein the edge of said receptacle can be reversely folded over said frame and gathered to detachably secure said receptacle to said frame by securement of said fastener means to said receptacle for manual collection of waste in said receptacle.

4,705,311

COMPONENT PICK AND PLACE SPINDLE ASSEMBLY WITH COMPACT INTERNAL LINEAR AND ROTARY DISPLACEMENT MOTORS AND INTERCHANGEABLE TOOL ASSEMBLIES

Phillip A. Ragard, Binghamton, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.

Filed Feb. 27, 1986, Ser. No. 833,254
Int. Cl.[4] B65G *47/91*; H05K *13/02*
U.S. Cl. 294—2 **15 Claims**



1. In a head assembly for pick and place of components, and comprising a component pick-up device reciprocatable along a longitudinal axis and means for imparting reciprocation to said pick-up device, the improvement comprising:

a casing;

said reciprocation imparting means comprising a direct drive linear motor enclosed within said casing;

means, connected to said casing and operatively associated with said pick-up device, for squaring said component relative to an orthogonal coordinate system having one axis generally parallel to said longitudinal axis; and

means, operatively associated with said pick-up device, for orienting said component about said longitudinal axis, said orienting means comprising a direct drive rotary motor enclosed within said casing and operatively associated with a tool assembly having component engaging fingers.

4,705,312

INSULATED BUILDING BLOCK HANDLING TOOL

Daryl L. Vooge, 4011 Meadow View Dr., Pasco, Wash. 99301-9486, and Jeffery E. Bare, 2505 S. Ledbetter, Kennewick, Wash. 99336

Filed Oct. 22, 1986, Ser. No. 922,512
Int. Cl.[4] B65G *7/12*
U.S. Cl. 294—62 **16 Claims**

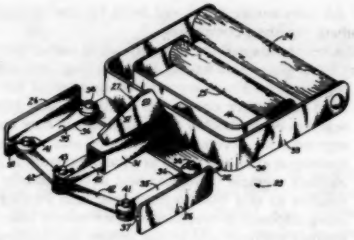
1. A handling tool for an elongated insulated building block having a central opening of substantially rectangular cross section, including opposed longitudinal side wall surfaces joined by transverse end wall surfaces extending at least partially through the block, and having a layer of insulation within the opening along one of the longitudinal wall surfaces of the opening, the handling tool comprising:

a tool handle;

a frame extending from the tool handle;

a pair of gripping members mounted to the frame for movement relative to one another and having elongated gripping surfaces thereon adapted for substantially flush engagement with the transverse end wall surfaces of the central opening of the insulated building block;

wherein the gripping surfaces each have a width dimension less than the distance within the block across the central opening between the layer of insulation and the longitudinal side wall surface opposite the layer of insulation such that the gripping surfaces may be inserted into the central opening of the insulated building block adjacent the transverse end wall surfaces thereof without engaging the layer of insulation;



actuator means on the frame and operatively connected to the gripping members for moving the gripping surfaces relative to one another from a first position wherein the gripping surfaces are spaced to enable insertion of the gripping surfaces into the central opening, to a second position wherein the gripping surfaces are spaced apart to forcibly engage the transverse end wall surfaces of the central opening; and

guide means on the frame for engaging the longitudinal wall surface of the central opening opposite the layer of insulation and for positioning the gripping surfaces along the transverse end wall surfaces of the central opening adjacent to the layer of insulation and spaced from the longitudinal side wall surface opposite the layer of insulation to substantially center the tool handle with respect to the center of gravity for the insulated building; and

wherein the gripping members are mounted to the frame for pivotal movement about substantially parallel pivot axes and the actuator means is comprised of manually operable toggle links interconnecting the gripping members at points thereon spaced from their pivot axes.

4,705,313

SELECTIVE GRIPPING OF INSIDE AND OUTSIDE OF ARTICLES

John G. Radice, Binghamton, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.

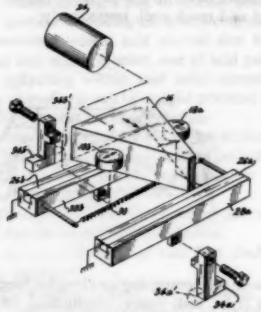
Filed Jun. 30, 1986, Ser. No. 879,949
Int. Cl.[4] B66C *1/42*; B25J *15/04*
U.S. Cl. 294—94 **2 Claims**

1. An apparatus for selectively engaging inner and outer surfaces of components in order to effect gripping thereof, and comprising:

means for spreading gripping fingers apart to engage an inner surface of said component and closing said fingers toward each other to engage an outer surface of said component, selectively, according to respective inside and

outside gripping modes, said finger spreading and closing means comprising a displaceable wedge-like cam having said cam surfaces;

means for prepositioning said fingers relative to each other according to one of said gripping modes, said prepositioning means comprising cam followers operatively associated with said fingers and in engagement with cam surfaces of said finger spreading means such that initial positioning of at least one follower and corresponding cam surface dintinguishes between said inside and outside gripping modes upon performing said finger moving;



spring means for biasing and retaining said cam followers in engagement with said cam surfaces such that said fingers are positively displaceable into said gripping engagement by displacement of said cam;

means for positioning said fingers relative to said component, after said prepositioning, in order to effect said gripping mode selected; and

means for moving said fingers into engagement with a component surface according to said gripping mode selected in order to effect said gripping.

4,705,314

TOOL LOADING DEVICE

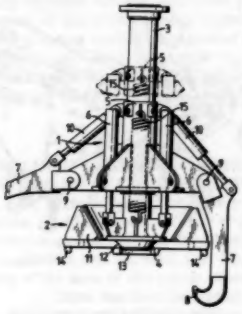
John Moore, Aberdeen, Scotland, assignor to The British Petroleum Company p.l.c., London, England

Filed Apr. 4, 1986, Ser. No. 848,127

Claims priority, application United Kingdom, Apr. 12, 1985, 8509437

Int. Cl.[4] B63C *11/52*; B66C *1/06*

U.S. Cl. 294—115 **6 Claims**



1. A tool loading device comprising (i) a centralizing hub, connectable to a tool entry system, the centralizing hub having an entry in its upper surface and a projection and/or recess on its lower suface and (ii) a latch arm section, the latch arm section comprising (a) a tube for carrying the tool, (b) latch arm pivot hub slidably mounted on the tube, (c) latch arms pivoted at one end to the latch arm pivot hub and bearing a lug at the other end adapted for engagement with the projection and/or recess on the cetralizing hub, (d) latch arm engagement rams pivotably mounted at one end to the latch arm pivot hub and at the other to a pivot point on the latch arm, and (e) vertical alignment rams connecting the latch arm pivot hub to the centralizing hub, the centralizing hub and the latch arm section being spring loaded to achieve a fail safe mode of operation with the latch arms disengaged.

4,705,315

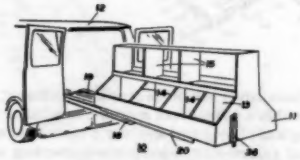
SLIDABLE STORAGE CONTAINER

Kim N. Cherry, 1524 Meridian St., Meridian, Id. 83642

Filed Oct. 10, 1986, Ser. No. 917,684

Int. Cl.[4] B60R *11/06*

U.S. Cl. 296—37.1 **3 Claims**



1. A storage container for use in an enclosed van which comprises:

a plurality of van frame members attached to the floor of the cargo area of a van that is directly accessible through a cargo door, in parallel spaced relationship to each other, and, all perpendicular to the cargo door of the van; and

van frame end rollers rotatably attached to the ends extending toward the cargo doors of each of the van frame members; and

a plurality of van frame intermediate stop rollers rotatably attached to each of the van frame members in parallel and equidistant relationship to the van frame end rollers; and

said rollers of conforming size and diameter for insertion into a channel of a slide rail; and

a plurality of slide rails held in parallel spaced relationship to each other, each of said slide rails having a van roller channel on a side for receiving said van frame intermediate and end rollers, and having at the ends of each of said channels, means for stopping the travel of said van rollers; and

said slide rails each further having, on the opposite side from the van channel, a container channel for receiving container intermediate stop and end rollers, and having at the ends of each of said container channels, means for stopping the travel of container rollers; and

a plurality of container frame members held in parallel spaced relationship; and

container frame end rollers rotatably attached to one end of each of said container frame members, said container frame end rollers being of conforming size and diameter for insertion into the container channels of the slide rails; and

container frame intermediate stop roller rotatably attached to each of the container frame members in parallel and equidistant relationship to the container frame end rollers; and

a container for the storage of goods attached to the container frame members.

4,705,316

WIND DEFLECTOR ASSEMBLY FOR VEHICLES AND INSTALLATION UNIT EQUIPPED THEREWITH

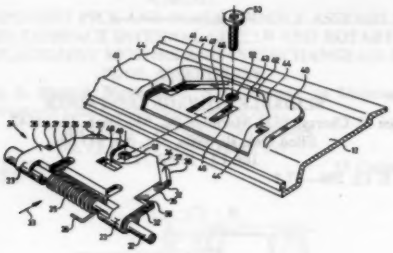
Hans Jardin, Inning, and Karl Dworschak, Munich, both of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Stockdorf Gauting, Fed. Rep. of Germany

Filed Jan. 8, 1985, Ser. No. 689,601

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401550

Int. Cl.[4] B60J *7/22*

U.S. Cl. 296—217 **14 Claims**



1. In an installation unit of the type for attachment to a frame mounted within a vehicle roof aperture, to which a roof panel for opening and closing said aperture is mountable and having longitudinal guides, a cross-piece interconnecting said guides at a forward end thereof, support means for supporting said roof panel in a displaceable manner, and cable drive means connected between said cross-piece and said support means for producing displacement of the roof panel, all of which are associated with each other in an operational manner enabling complete testing of said cable drive means to establish the proper operability thereof without attachment of said installation unit to said frame, the improvement for enabling hinged attachment of a deflector assembly to a carrier part of the installation unit by way of a releasably attachable carrier part and a bearing block, as well as alignment and operational testing for establishing the proper operation thereof, in a manner enabling the installation unit to be attached to the vehicle roof frame without necessitating re-assembly or re-alignment of the deflector assembly, wherein the carrier part is provided with guides, said guides being sized and configured relative to complementary guide parts of the bearing block for slidably receiving the bearing block, wherein at least one spring latch means is provided for a temporary fixing of the bearing block relative to the carrier part upon insertion thereof into the guides, and wherein attachment means is provided for installation securement of said bearing block to both said carrier part and said frame.

4,705,317

CONTAINER FOR TRUCK PLATFORM

Denis R. Henri, R.R. #1, Box 100, Hammond, Ontario, Canada K0A 2A0

Continuation of Ser. No. 591,983, Mar. 19, 1984, abandoned. This application May 27, 1986, Ser. No. 867,636

Claims priority, application Canada, Jun. 3, 1983, 429,617

Int. Cl.[4] B60R *5/00*

U.S. Cl. 296—37.6 **17 Claims**

1. A container assembly for installation within a pick-up truck, said truck including a platform and a truck wall extending upwardly from said plateform, said container assembly extending over a part of the area of said platform comprising:

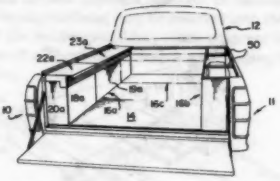
an elongate container front wall having upper and lower longitudinal edges spaced from said truck wall;

a container top extending from said truck wall to said upper longitudinal edge of said container top wall;

a container end wall extending from said truck wall to form a corner of said container with a vertical edge of said front wall, wherein vertical edges of said front wall and end wall jointly defining said corner have interengageable formations extending the height of said walls to provide connection therebetween;

means for securing said container top and said front wall lower lognitudinal edge to said truck wall and said platform, respectively, so that said truck wall and said platform form a back wall and a bottom, respectively, of said container;

means for sealing said front wall lower longitudinal edge and said container cover in a watertight manner to said plateform and said truck wall, respectively;



said container top comprising an elongate hinged lid overlying said front wall upper longitudinal edge and hinge means connected to said elongate hinged lid for allowing pivotation thereof between open and closed positions;

said container top, said front wall and said end wall, prior to assembly, being nested in one another for transportation and storage in substantially flat condition; and

retaining means secured to said truck wall and to said front wall upper longitudinal edge for retaining the latter in position, said retaining means being spaced from opposite ends of said container.

4,705,318

SEAT BACK RECLINING MECHANISM

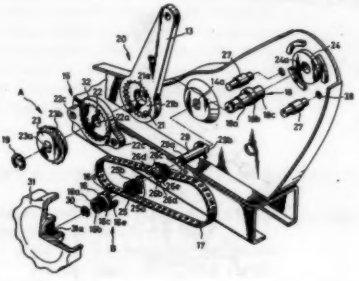
Yukifumi Yamada; Takami Terada, and Toshihito Miyagawa, all of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed Feb. 24, 1986, Ser. No. 832,393

Claims priority, application Japan, Feb. 25, 1985, 60-26167[U]

Int. Cl.[4] B60N *1/02*

U.S. Cl. 297—362 **7 Claims**



1. A seat back reclining mechanism comprising:

an upper bracket supporting a seat back portion of a seat assembly and having a pivotal slot;

a lower bracket supporting a seat cushion portion of said seat assembly, said upper bracket being pivotally attached to said lower bracket;

internal gear means formed on said upper bracket and hav-

ing inwardly directed gear teeth coaxially disposed about said pivotal slot;

a disc plate secured to said lower bracket and having external gear means disposed in meshed engagement with said internal gear means, said disc plate having an axial aperture and said external gear means having outwardly directed gear teeth circumferentially disposed relative to said axial aperture, the number of said internal gear teeth being more than the number of said external gear teeth;

first shaft means pivotally mounted on said lower bracket for pivoting said upper bracket relative to said lower bracket, said shaft means having a pair of coaxial portions and an eccentric portion extending therebetween, said eccentric portion mounted within said pivotal slot for rotatably supporting said upper bracket, one of said pair of coaxial portions extending within said axial aperture and the remaining one of said pair of coaxial portions being pivotally attached to said lower bracket;

actuating means for controlling the pivoal movement of said first shaft means, said actuating means including:

second shaft means fixedly mounted on said lower bracket;

a drive sprocket rotatably mounted on said second shaft means and having an axial projection;

a driven sprocket secured to said first shaft means for rotation therewith;

power transmitting means for engaging said drive sprocket and said driven sprocket to rotate said driven sprocket in response to rotation of said drive sprocket;

constraining means for preventing rotation of said drive sprocket by said power transmitting means in response to rotation of said driven sprocket, said constraining means including a knob member rotatably mounted on said second shaft means and an actuating member secured to said knob member to regulate the rotation of said knob member, said knob member having an axial extension coaxially disposed and radially spaced relative to said second shaft means, said axial extension defining a cutout for receiving said axial projection, said axial extension and said axial projection providing a substantially continuous annular surface, said constraining means also including a coil spring disposed along said second shaft means between said knob member and said drive sprocket, said coil spring having a normal diameter which is slightly less than the diameter of said second shaft means, said coil spring having opposing end portions disposed along opposite sides of said axial projectionu for engaging said axial extension along said cutout, each of said opposing end portions extending along opposite sides of said axial projection, so that rotation of said knob member expands the diameter of said coil spring enabing engagement between said axial extension and axial projection to rotate said drive sprocket, whereby rotation of said axial projection by said power transmitting means tightens said spring.

4,705,319

SEAT RECLINER MECHANISM WITH SPRING COIL ACTUATOR AND CREEP ELIMINATOR FEATURE

Robert L. Bell, Oxford, Mich., assignor to Fisher Dynamics Corporation, St. Clair Shores, Mich.

Continuation-in-part of Ser. No. 753,047, Jul. 1, 1985. This application Sep. 16, 1985, Ser. No. 776,362

The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.

Int. Cl.[4] B60N *1/02*

U.S. Cl. 297—362 **7 Claims**

1. A seat recliner mechanism for supporting a seat back and a seat bottom which permits the angle therebetween to be controllably varied comprising:

a lower recliner structure supporting said seat bottom,

an upper recliner structure supporting said seat back,

a first pivot rotatably attaching said lower recliner structure to said upper recliner structure,

a toothed rack operatively connected to one of said upper or lower recliner structures,

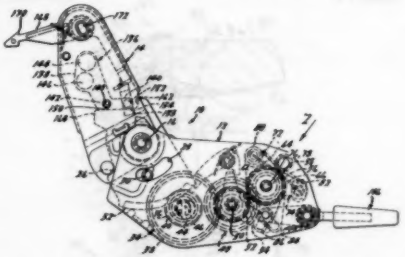
gear means carried by the other of said upper or lower recliner structures for engaging said toothed rack and controlling the positioning of said toothed rack,

an actuator clutch drum carried by the other of said upper or lower recliner structures and rotatably driven by said gear means,

a unitary coil clutch spring wrapping around said actuator clutch drum, said coil clutch spring having first and second spring ends,

first spring engaging means carried by the other of said upper or lower recliner structures for engaging said first spring end,

second spring engaging means carried by the other of said upper or lower recliner structures for engaging said second spring end,



actuation means carried by the other of said upper or lower recliner structures for producing relative movement between said first and second spring engaging means thereby moving said first and second spring ends from an engaged position in which said coil clutch spring frictionally engages said clutch drum such that said first spring engaging means restrains rotation of said actuator clutch drum in a first rotational sense and said second spring engaging means restrains rotation of said clutch drum in a second rotational sense wherein the relative angular positioning between said lower and upper recliner structures is established, to a disengaged position in which said coil clutch spring frictionally disengages said actuator clutch drum wherein the relative angular positioning between said lower and upper recliner structures is adjustable, and

spring means urging said spring engaging means to said engaged position.

4,705,320

ICE RESURFACING MACHINE BLADE HOLDER

Richard F. Zamboni, Huntington Beach, Calif., assignor to Frank J. Zamboni & Co. Inc., Paramount, Calif.

Filed Jun. 10, 1986, Ser. No. 872,406

Int. Cl.[4] E02B *15/02;* **E01H** *5/06*

U.S. Cl. 299—24 **18 Claims**

1. An ice resurfacing machine blade holder which comprises:

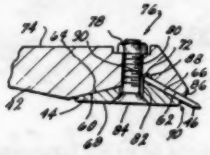
a blade attachment member, said blade attachment member sized and shaped so as to have an elongated transverse dimension sufficient to extend across the width of the resurfacing path of said ice resurfacing machine, said blade attachment member having a forward edge and a bottom surface and a top surface all of which extend across said elongated transverse dimension of said attachment member;

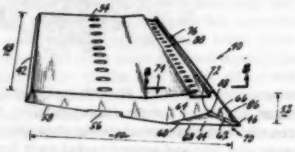
said blade attachment member including an inverted "V" shaped groove extending into said bottom surface across said elongated transverse dimension of said attachment

member along said forward edge of said attachment member, said "V" shaped groove having an essentially flat planar blade abutting surface and an essentially flat planar retaining element abutting surface, said blade abutting surface positioned towards and intersecting said forward edge of said blade attachment member with said blade abutting surface located between said forward edge and said retaining element abutting surface, said blade abutting surface and said retaining element abutting surface intersecting each other at an obtuse angle;

a retaining element, said retaining element being essentially triangular in shape in cross section and having an elongated transverse dimension essentially equal to said elongated transverse dimension of said attachment member;

said retaining element having an essentially flat planar blade engaging wall and an essentially flat planar attachment member engaging wall and a bottom wall each of which intersects the others to form said triangular cross sectional shape, said blade engaging wall and said attachment member engaging wall intersecting each other at an obtuse angle equal to or essentially slightly greater than the angle of intersecting of said engagement member blade abutting surface and retaining element abutting surface;





said retaining element positionable on said attachment member with said attachment member engaging wall mating with said retaining element abutting surface and said blade abutting surface and said blade engaging wall being spaced apart from one another in an essentially parallel alignment to form a cavity between said attachment member blade abutting surface and said retaining element blade engaging wall, said essentially parallel alignment of blade abutting surface and said blade engaging surface shaping said cavity so as to accept a disposable ice resurfacing blade within said cavity;

locking means for retaining said retaining element in said mating position against said attachment member whereby said disposable ice resurfacing blade is capable of being temporarily fixedly retained in said cavity.

4,705,321

DEVICE FOR SUPPLYING FLUID TO A TOOL FOR BREAKING HARD MATERIAL

Jan-Gunnar Hedlund, Sandviken, Sweden, assignor to Santrade Limited, Lucerne, Switzerland

Filed Jun. 10, 1986, Ser. No. 872,651

Claims priority, application Sweden, Jun. 13, 1985, 8502936

Int. Cl.[4] F21B *10/18*; E21C *35/22*

U.S. Cl. 299—81 **11 Claims**

1. Apparatus for breaking solid material comprising:

a machine part including a first surface,

tool means mounted on said machine part and including:

a holder having a second surface opposing said first surface to define an interface between said machine part and said holder,

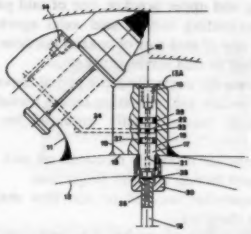
a cutting member mounted on said holder, and

at least one fluid nozzle mounted in said tool means for directing fluid toward material being cut;

a fluid conducting passage for conducting fluid from said machine part to said nozzle, said passage including:

a first channel in said tool means, and

a second channel in said machine part, said first and second channels communicating with one another at said interface,



a connection element disposed in said passage at said interface and extending into said first and second channels to bridge said first and second surfaces, said connection element including a conduit for conducting said fluid from said second channel to said first channel, and

sealing means for creating a fluid seal between said connection element and walls of said first and seconds channels to prevent fluid in said passage from reaching said interface,

said first channel extending to an outer face of said tool means and being of sufficiently large cross-section to permit said connection element to be removed and inserted through said outer face while said holder remains attached to said machine part.

4,705,322

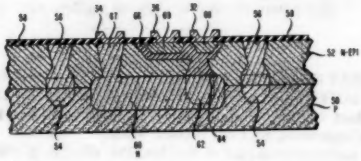
PROTECTION OF INDUCTIVE LOAD SWITCHING TRANSISTORS FROM INDUCTIVE SURGE CREATED OVERVOLTAGE CONDITIONS

Aristides A. Yiannoulos, Wyomissing Hills, Pa., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 5, 1985, Ser. No. 752,128

Int. Cl.[4] H02H *3/20*

U.S. Cl. 361—91 **3 Claims**



1. Integrated circuit arrangement including an inductive load switching transistor with overvoltage protection, said arrangement comprising:

a semiconductor substrate of a first conductivity type,

an epitaxial layer of a second conductivity type, including first and second major surfaces, overlying the substrate such that the first major surface is in intimate contact with said substrate, said inductive load switching transistor

being formed in the substrate and epitaxial layer and comprising

a buried collector region of the second conductivity type formed in said substrate and said epitaxial layer in the region of said epitaxial layer first major surface,

a collector contact region extending from the second major surface of the epitaxial layer downward to contact the buried collector,

a base region of the first conductivity type formed between the buried collector region and the second major surface of the epitaxial layer,

contact means contacting the base region,

an emitter region of the second conductivity type formed in the second major surface of the epitaxial layer and surrounded by said base region,

contact means contacting the emitter region,

the invention characterized by an additional region of the first conductivity type extending from a portion of the base region to, and into contact with, the buried collector region to form, with the buried collector, a pn junction Zener diode for forward biasing during overvoltage conditions and activating the inductive load switching transistor and allowing a portion of any overvoltage-created current to flow through said inductive load switching transistor.

4,705,323

BRAKE CONTROL APPARATUS FOR VEHICLE

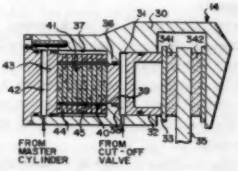
Yuzo Imoto, Kariya; Toshihiro Takei, Okazaki; Yoshiyuki Hattori, Toyoake; Haruhiko Uno, Anjo; Mitsuo Inagaki, Okazaki, and Kenji Takeda, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Nippon Soken, Inc., Nishio, both of, Japan

Filed Jun. 12, 1986, Ser. No. 873,385

Claims priority, application Japan, Jun. 14, 1985, 60-128032; Jun. 14, 1985, 60-128033; Jun. 14, 1985, 60-128034

Int. Cl.[4] F16D *55/08;* **B60T** *8/02*

U.S. Cl. 303—116 **13 Claims**



1. A brake control apparatus for a vehicle, comprising:

wheel cylinders respectively formed at brake calipers for wheels,

brake pistons respectively movably provided in said wheel cylinders, each having a first fluid chamber partitioned in said wheel cylinder so that said brake piston is driven in response to the pressure of the fluid chamber to operate a brake force at the wheel corresponding to a brake pad driven integrally with said brake piston,

piston mechanisms formed of a plurality of piezoelectric elements, each provided in a control cylinder formed adjacent to said wheel cylinder to control to expand or contract said piston mechanism in response to a voltage applied to said piezoelectric elements to variably control the pressure of the first fluid chamber in said wheel cylinder,

a master cylinder for generating fluid pressure responsive to the braking operation to operate the fluid pressure to the first fluid chamber through a fluid passage,

cut-off valves, each provided in said fluid passage to partition the first fluid chamber of said wheel cylinder from said master cylinder in closed state to maintain the volume of the fluid chamber constant,

check valve mechanism, each provided in parallel with said cut-off valve and set to allow only the fluid to flow from said master cylinder to said wheel cylinder, and

control means having means for detecting fluid pressure generated from said master cylinder for closing said cut-off valves in the state the fluid pressure generated from said master cylinder becomes a predetermined level or higher to control a voltage applied to the piezoelectric elements of said piston mechanism so as to control the pressure of the first fluid chamber of said wheel cylinder.

4,705,324

BRAKE-PRESSURE CONTROL AND MODULATION SYSTEM FOR AN ANTILOCKING BRAKE CIRCUIT ASSEMBLY COMPONENT FOR A DISC BRAKE

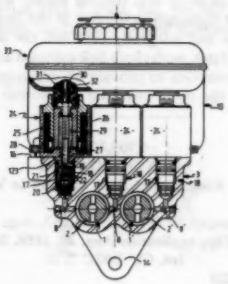
Gilbert Kervagoret, Argenteuil, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Jun. 5, 1985, Ser. No. 741,651

Claims priority, application France, Jun. 13, 1984, 84 09206

Int. Cl.[4] B60T *8/00, 13/14;* **F15B** *7/00*

U.S. Cl. 303—119 **8 Claims**



1. A brake-pressure control and modulation for at least one brake circuit of a motor vehicle, comprising, inside a body, at least one manually operable brake pressure control device having a fluid outlet in fluid communication with the brake circuit, a brake fluid reservoir mounted on the body, and an isolating and pressure-reducing solenoid valve means operable for controlling fluid flow in the brake circuit, the solenoid valve means being mounted on the body and having its discharge outlet formed by a discharge end opening into the reservoir and extending through an enclosing wall of the reservoir, the solenoid valve means being formed with an internal through passage and including a casing interposed between the body and an extension part of the reservoir, the discharge end being sealingly received in the extension part of the reservoir, the end thereof opposite said discharge end including a distribution valve part enclosing valve means and mounted in a recess in the body which recess communicates with both a fluid outlet of the brake-pressure control device and with the brake circuit.

4,705,325

ENDLESS TRACK HAVING SYNTHETIC PLATES WITH CHAIN LINK CONNECTIONS

Horst Oerding, Beverstedt, Fed. Rep. of Germany, assignor to Felasto Pur GmbH & Co. KG, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 707,100, Mar. 1, 1985, abandoned. This application Nov. 24, 1986, Ser. No. 933,887

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1984, 8432310[U]

Int. Cl.[4] B62D *55/20, 55/26*

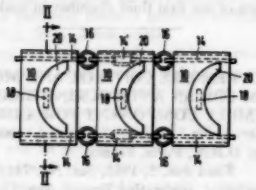
U.S. Cl. 305—35 R **12 Claims**

1. A continuous endless track for vehicles having rubber-tired individual wheels comprising:

a plurality of bottom plates fabricated of an elastic synthetic material;

at least two tie bolts penetrating each individual bottom plate oriented along the continuous length of the endless track, and

coupling elements connecting adjacent tie bolts to one another in the endless track length direction,



said tie bolts being chains of at least three connected chain links having their closed arched ends projecting beyond the end faces of said bottom plates, which end faces extend at right angles relative to the length of the endless track and integrally cast into the material of said bottom plates, each chain link oriented at right angles to the adjacent one to provide an improved positive lock between the chain links and the bottom plate.

4,705,326

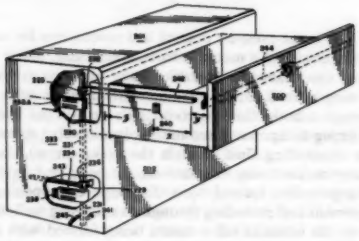
LOCKING SYSTEM

Clark E. Craig, Simpsonville, S.C., assignor to Valhi, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 768,157, Aug. 22, 1985, Pat. No. 4,684,178. This application Aug. 20, 1986, Ser. No. 898,094

Int. Cl.[4] E05C 7/06

U.S. Cl. 312—221 **8 Claims**



1. An improved locking system for a vertical array of drawers, said drawers having side walls, said drawers each slidably mounted in a drawer cabinet having at least one cabinet side wall, said system comprising, in combination:

a rib member projecting from a side wall of each drawer;

a generally vertical pivot rod on said cabinet side wall extending adjacent the drawer side walls;

at least one dog laterally extending from the rod adjacent each drawer side wall and pivotal with the rod between a first position of non-engagement with a drawer rib and a second position of engagement with a drawer rib;

biasing means for pivotally biasing the rod and dogs toward the first position; and

means mounted on at least one drawer for continuously pivoting the rod and stop members toward the second position when said one drawer is open, said means comprising a horizontal rail on a side wall of said one drawer for engaging the rod and cooperative means on the rod continuously only when the one drawer is at least partially open whereby the rod is biased to the first position whenever the drawers are fully closed.

4,705,327

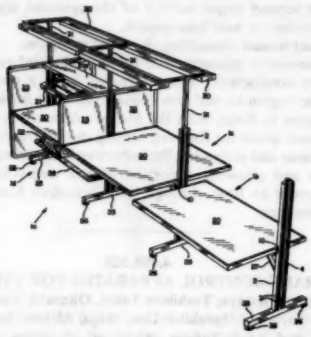
MULTI-ADJUSTABLE, MULTI-FUNCTIONAL WORK STATION SYSTEM

Clifford J. Bollman, 715 NE. 138th Ave., Vancouver, Wash. 98664

Continuation-in-part of Ser. No. 654,952, Sep. 27, 1984, abandoned, which is a continuation of Ser. No. 417,543, Sep. 13, 1982, abandoned. This application Mar. 26, 1986, Ser. No. 844,135

Int. Cl.[4] A47B 9/00

U.S. Cl. 312—312 **28 Claims**



1. A multi-adjustable, multifunctional work station system, which comprises:

accessory means for providing a work surface;

at least one vertically-extending support means for supporting said accessory means in a plurality of horizontal and angular positions with respect to the vertical axis of said support means;

a pair of vertically-extending track means located in each support means, disposed generally parallel one with respect to the other, and spaced apart at a distance which will faciliate bracing of said accessory means in a fixed position with respect to said support means, and at a distance for facilitating the structural integrity of said support means;

means defining a channel in each of said track means;

a pair of vertically-extending flange means, attached to said track means for retaining attachment means within the channel means of each said track means,

connector means for adjustably coupling said accessory means to each said track means;

a pair of attachment means which ride within the channels of said pair of track means for pivotally coupling the connector means tothe track means, each of said attachment means being independently movable in a generally upward and downward direction within the channels of said pair of track means to a plurality of positions along the vertical axis of said track means;

the connector means including means for coupling each of the attachment means to the connector means;

means for allowing a predetermined amount of independent movement between each connector means and each attachment means within a predetermined range so that the connector means can be positioned in a plurality of angular positions with respect to the vertical axis; and

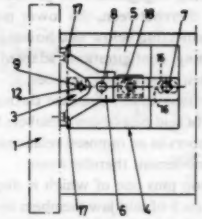
the accessory means being attached to said connector means and thereby being adjustable to a plurality of horizontal and angular positions with respect to the vertical axis of said support means by said movement of each of said attachment means within said pair of track means.

4,705,328

MOUNTING DEVICE FOR FRONT MEMBERS OF DRAWERS

Erich Röck, Höchst, and Helmut Hollenstein, Lustenau, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Jun. 24, 1986, Ser. No. 877,789
Claims priority, application Austria, Jun. 25, 1985, 1878/85
Int. Cl.[4] A47B 88/00
U.S. Cl. 312—330 R 10 Claims



1. A device for mounting a front panel of a drawer, said device comprising:

a holding element fastenable to the front panel;

a fastening element to be fixed to a side wall of the drawer;

a hook member extending substantially perpendicular to the front panel and having a first end including means for engaging said holding element;

means for mounting a second end of said hook member for pivotal movement about an axis extending substantially horizontally and parallel to the front panel, and for selectively shifting said hook member and said holding element relative to said fastening element in a direction perpendicularly of the front panel, thereby clamping the front panel in a mounted position;

means, operable between said fastening element and said hook member, for selectively moving said hook member and said holding element laterally relative to said fastening element, and thereby for adjusting the relative horizontal position of the front panel with respect to the drawer; and

means, operable between said fastening element and said hook member, for selectively pivoting said hook member and said holding member about said axis relative to said fastening element, and thereby for adjusting the relative vertical position of the front panel with respect to the drawer.

4,705,329

APPARATUS FOR ELECTRICAL FUNCTION CHECKING OF WIRING MATRICES

Günter Doemens, Holzkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 2, 1986, Ser. No. 902,744
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1985, 3531594
Int. Cl.[4] G01R 31/02
U.S. Cl. 324—73 PC 10 Claims

1. An apparatus for electrical function checking of wiring matrices having measuring locations, comprising:

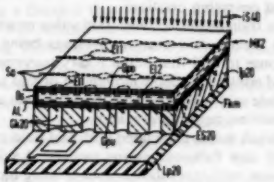
a carrier plate for placement on a wiring matrix to be tested;

a plurality of gas discharge channels provided in said carrier plate;

electrodes disposed in said gas discharge channels;

electrode bus bars connected to said electrodes for selecting ones of said electrodes; and

means for controllably charging said gas discharge channels with a radiation, the measuring locations of said wiring matrix to be tested being contactable through selected ones of said gas discharge channels and said electrodes by



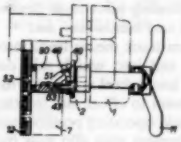
the controllable charging with radiation to initiate gas discharges.

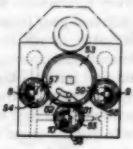
4,705,330

FLUID INJECTORS

David Tindall, South Ascot, England, assignor to Spectus Limited, Reading, England

Filed May 7, 1984, Ser. No. 607,768
Claims priority, application United Kingdom, May 6, 1983, 8312510
Int. Cl.[4] B05B 9/03
U.S. Cl. 239—125 24 Claims





1. A fluid injector comprising:

an injection device;

fluid connection means fluidly connecting said injection device to a fluid delivery line external to said fluid injector, said injection device being removably mounted relative to said fluid connection means;

valve means for controlling fluid communication between said fluid connection means and said injection device;

actuator means, first initial rotary movement of which selectively rotates said valve means to an isolate position so as to fluidly isolate said fluid connection means from said injection device, first continued rotary movement of which in the same rotary direction effects removal of said injection device from said fluid connection means, said first continued rotary movement to effect said removal of said injection device being possible only after completion of said first initial rotary movement to rotate said valve means to said isolate position, second initial rotary movement of which in the opposite rotary direction effects insertion of said injection device relative to said fluid connection means to an operating position, second continued rotary movement of which in said opposite rotary direction rotates said valve means to a position at which said valve means fluidly communicates said fluid connection means with said injection device, said second continued rotary movement to rotate said valve means to its said position at which to fluidly communicate said fluid con-

nection means and said injection device being possible only after completion of said second initial rotary movement to effect said insertion of said injection device to its said operating position;

a gear train means between said valve means and said actuator means, said gear train means being rotatable in response to said first initial rotary movement and said second continued rotary movement of said actuator means to rotate said valve means to its said isolate and communicate positions, respectively; and

cam track means associated with said fluid connection means and cam follower means associated with said actuator means, said cam follower means being movable relative to said cam track means in response to said first continued rotary movement and said second initial rotary movement of said actuator means to effect said removal and insertion, respectively, of said injection device from and to its said operating position;

wherein said actuator means includes a rotatable handwheel shaft having a handwheel secured thereto, said cam follower means is fast with said handwheel shaft which is rotatable by said handwheel, said handwheel shaft is axially fast with said injection device, and said cam track means is fashioned on a stationary member of said fluid connection means and is so configured that rotation of said handwheel causes said cam follower means and said handwheel shaft as it rotates to move axially thereby inserting said injection device to, or removing said injection device from, said operating position in dependence on the sense of rotation of said handwheel; and

wherein said cam track means leads into a slot formed in a second shaft and into which said cam follower means slides as said handwheel completes its said second initial rotary movement to effect said insertion of said injection device to its said operating position, said second shaft is in driving engagement with said gear train means, said second continued rotary movement of said handwheel engages said cam follower means with said slot to rotate said second shaft and hence said gear train means in one rotary sense to rotate said valve means to its said position to fluidly communicate said fluid connection means with said injection device, said first initial rotary movement of said handwheel engaging said cam follower means with said slot to rotate said second shaft and hence said gear train means in the opposite rotary sense to rotate said valve means to its said isolate position, said cam follower means slides from said slot as said handwheel completes its said first initial rotary movement to be engaged with said cam track means to effect removal of said injection device from its said operating position as said handwheel executes its said first continued rotary movement.

4,705,331

SUBSEA CLAMPING APPARATUS

James N. Britton, Houston, Tex., assignor to Wayne Graham & Associates International, Inc., Houston, Tex.

Filed Jan. 11, 1985, Ser. No. 690,760

Int. Cl.[4] H01R *33/00*

U.S. Cl. 439—387 **41 Claims**

1. A self-actuating clamp for attachment to a member disposed in subsea environment, comprising

a housing, including

a pair of spaced side members, each of said side members having disposed therein a pair of horizontally spaced angled slots, the pair of horizontally spaced slots disposed in one side member registering with the pair of horizontally spaced slots disposed in the other of said side members for forming two pairs of registered horizontally spaced-apart elongated angled slots, each of said pair of registered slots slanting inwardly and upwardly toward the top edges of said side members,

a compression plate mounted transversely to the to edges of said pair of side members and having an aperture disposed centrally therethrough, and

at least one external accessary mounting plate attached transversely to said pair of side members,

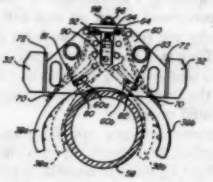
a pair of opposed elongated jaw members the upper portions of which are disposed within said housing and between said pair of spaced side members and below said compression plate, the upper ends of said jaw members adapted for pivotal mating engagement for permitting limited pivotal movement therebetween, the lower portions of said jaw members projecting below said housing side members and having mating configurations adapted for clamping engagement with the subsea member,

a pivot pin transversely disposed through said upper mating ends of said pair of jaw members for supporting said jaw members in an opposed relationship and permitting pivotal movement therebetween,

a pair of stop pins one of which is disposed transversely through each of said jaw members and projects through one of said pair of registered horizontally spaced-apart elongated angled slots and each of said side members,

an inverted U-shaped clevis disposed over said mating ends of the pair of jaw members and engaging the opposite ends of said pivot pin,

an elongated clevis rod fixed to said inverted U-shaped clevis and projecting vertically through said aperture in said compression plate,



trigger means, comprising

an elongated latch member having a transverse aperture in one end adapted for pivotal engagement with the end of one of said jaw stop pins projecting beyond said one housing side member, the other end of said latch member having a downwardly opening vertical slot disposed therein for engaging the end of the other one of said pins projecting beyond said one housing side member when said jaw members are in an open position, and

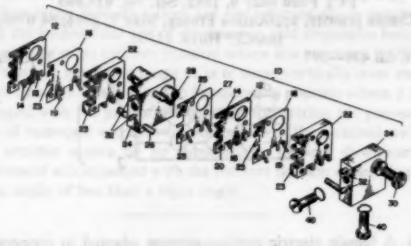
a trigger member attached to said latch member and projecting downwardly below said housing for physically contacting the subsea member when the subsea member is properly positioned between said spaced-apart jaw members, said trigger member engaging the subsea member for exerting an upward force on said latch member for pivoting said latch member slotted end upwardly out of engagement with said other jaw stop pin, and

force exerting means disposed within said housing and carried thereby and engaging each of said pair of jaws for exerting sufficient closing force on each of said jaw members for clamping said jaw members into engagement with said subsea member when said trigger latch member has been disengaged from said jaw stop pins.

4,705,332
HIGH DENSITY, CONTROLLED IMPEDANCE CONNECTORS

Amir-Akbar Sadigh-Behzadi, Van Nuys, Calif., assignor to Criton Technologies, Chatsworth, Calif.

Continuation of Ser. No. 762,706, Aug. 5, 1985, abandoned. This application Feb. 25, 1987, Ser. No. 16,968
Int. Cl.[4] H05K *1/00*
U.S. Cl. 439—69 **31 Claims**



1. A high density electrical connector with controlled impedance, comprising:

a plurality of discrete insulated wafers having generally flat sides;

a plurality of first conductive elements for carrying electrical signals protectively mounted by each wafer;

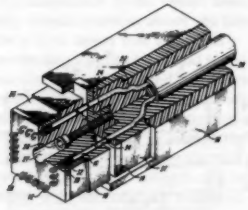
a single, second planar conductive element substantially covering said first elements and one of said wafer sides for connection to an electrical ground mounted only on one side of each wafer;

said plurality of discrete wafers mounted in a stack wherein each single, second, planar conductive element mounted only on one side of each wafer is mounted on each side of said plurality of first conductive elements to form stripline connections therewith in a high density stack wherein the impedance of each of said first conductive elements is controlled.

4,705,333
TEST PROBE FOR LEADLESS DEVICES

Stephen T. Sicard, Norton; Brian A. Pedro, Attleboro, and Wayne S. Alden, III, Whitman, all of Mass., assignors to Pylon Company, Inc., Attleboro Falls, Mass.

Filed Aug. 21, 1985, Ser. No. 767,809
Int. Cl.[4] H01R *9/11, 23/02*
U.S. Cl. 439—71 **10 Claims**



1. An assembly for releasably making electrical connection to a leadless surface mounted device remote from the assembly by a plug-like mounting and demounting action, the leadless surface mounted device having a peripheral side wall defining a perimeter and plural side contacts provided along the peripheral side wall to which the assembly is able to releasably make contact, comprising:

a probe housing having a multi-wire cable disposed therein and having a front end;

a plurality of spring contacts disposed in a predetermined array and outwardly extending from the front end of the probe housing a distance therebeyond selected to provide wiping contact of the leadless surface mounted device, the contacts being individually connected to an associated wire of the multi-wire cable;

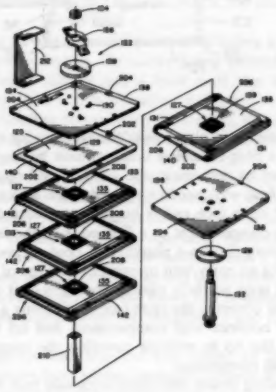
the spring contacts being in a configuration corresponding to the configuration of contacts of the surface mounted device to which the assembly is to be mated;

the array of spring contacts being disposed about a perimeter which is smaller than the perimeter of the surface mounted device such that the array of spring contacts is able to be received and released from the peripheral side wall of the surface mounted device by a plug-like mounting and demounting action in such a way that the array of spring contacts is able to be resiliently biased into electrical and mechanical engagement with the respective side contacts of the device.

4,705,334
ELECTRICAL DISTRIBUTION SYSTEM HAVING AN IMPROVED SPLICE JOINT BETWEEN BUSWAY SECTIONS

Allan E. Slicer, and Robert I. Whitney, both of Brookville, Ind., assignors to Square D Company, Palatine, Ill.

Continuation of Ser. No. 650,379, Sep. 13, 1984. This application Jun. 19, 1986, Ser. No. 878,389
Int. Cl.[4] H02G *5/08*
U.S. Cl. 439—210 **4 Claims**



1. A joint connector for providing a connection between sections of busway having a plurality of bus bars carried by each section of busway including a top and bottom ground bus, said joint comprising:

a top plate having a central opening therein,

a bottom plate having a central opening therein;

a pair of identical outer barriers each having an outer side and an inner side and each having a central circular opening therein;

a plurality of identical inner barriers, each having a central generally square-shaped opening therein;

a pair of ground connector plates respectively associated in facing relationship with said top plate and said bottom plate,

a pair of joint connector plates in facing relationship with each other on each side of each inner barrier, each of said ground connector plates and joint connector plates having a central generally square-shaped opening therein,

a bolt extending through said central openings in said top plate, said bottom plate, said outer barriers, said inner barriers, said ground connector plates and said joint connector plates; a nut threadingly engaged with said bolt and adapted to be tightened thereon; and

a generally square-shaped insulating tube extending between said outer barriers, said bolt extending through said tube for drawing said plates together in response to the tightening of said nut and bolt to effect a splice connection between bus bars of each section, said top plate and said bottom plate each includes portions defining a plurality of slots; and each of said outer barriers includes a pair of ears extending from said outer surface and respectively received in an associated one of said slots, said outer barriers each includes a receiving channel formed by square-shaped first ribs extending from said inner side around said central opening, said tube having opposite ends respectively received by said receiving channels.

4,705,335

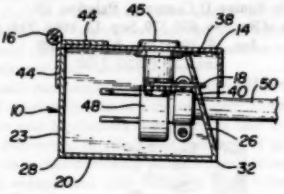
PLUG SAFE

Ronald G. Goebel, 1965 S. Sheridan, Denver, Colo. 80227

Filed Jan. 31, 1986, Ser. No. 824,447

Int. Cl.[4] H01R *13/44*

U.S. Cl. 439—133 **2 Claims**



1. An improved plug safe of the type having a box-like body defining a plug-receiving compartment having an open face surrounded by perimetric side walls, closed opposite the open face by a base wall, and having a lid that is selectively closeable over said open face and is hingedly connected to said plug-receiving compartment at a first edge of the lid; a front side wall defining therein a plurality of cord-receiving slots, each slot having an entry/exit opening at an edge of the open face, the lid at least partially closing the entry/exit opening of the slots when covering the open face, and having a locking means operable between said compartment and lid for selectively securing the lid in position covering the open face; the improvement comprising:

a mounting means associated with said base wall for fastening the plug safe to an underlying surface with the base wall against the underlying surface;

wherein said front side wall is angled acutely inwardly into said compartment from the base wall toward the open face and, in use, angularly urges cords received in said slots to move toward the slot base when the base wall is mounted horizontally or vertically such that the front side wall is carried in a side or bottom orientation;

said lid is hingedly attached to a back side wall opposite from said front side wall such that the lid is closeable forwardly over the front wall;

a substantially perpendicular depending lip at a second, opposite edge of the lid;

a blade lock carried on the lid and having a blade that is pivotable toward the lip for locking the lid to said front wall of the plug-receiving compartment; and

wherein the front wall defines a slot for receiving the blade, said slot being spaced by the angular disposition of the front wall inwardly from the lip by a substantial gap defining a blade receiving area.

4,705,336

PROCESSES FOR FABRICATING FEMALE ELECTRIC CONNECTOR ELEMENTS AND FEMALE CONNECTOR ELEMENTS THUS OBTAINED

Francois R. Bonhomme, 6 Parc de Béarn, 92 210 Saint Cloud, France

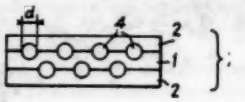
PCT No. PCT/FR85/00108, § 371 Date Dec. 31, 1985, § 102(e) Date Dec. 31, 1985, PCT Pub. No. WO85/05229, PCT Pub. Date Nov. 21, 1985

PCT Filed May 6, 1985, Ser. No. 814,963

Claims priority, application France, May 7, 1984, 84 07045

Int. Cl.[4] H01R *11/00*

U.S. Cl. 439—597 **14 Claims**



1. A female electric contact element adapted to cooperate with plugs having a diameter preferably at the most equal to 0.3 mm, comprising:

two supports which are formed from at least two separate pieces of insulating material, at least one of which supports is of an elastic material and which supports are assembled together into an assembly having opposed transverse faces and having one interior face against the other interior face, the facing surface of said supports being shaped such that, when assembled with said facing surfaces facing each other, they delimit therebetween a series of parallel cavities opening into at least one of said transverse faces of the assembly,

the interior face of at least one of said supports being coated with at least one metallized track within each cavity,

said metallized tracks comprising separate transverse parts shaped and positioned to contact an inserted plug, and at least one longitudinal part which is offset relative to surfaces of the cavity contacted by the plug or plugs and electrically connected to the transverse parts and providing electrical continuity from one of said transverse faces to the other of said transverse faces.

4,705,337

ELECTRICAL CONNECTOR HOUSING

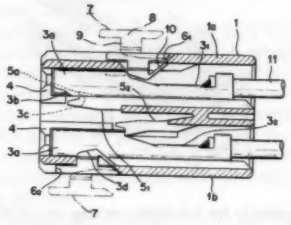
Akira Maeda, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Apr. 7, 1986, Ser. No. 849,188

Claims priority, application Japan, Apr. 8, 1985, 60-72801

Int. Cl.[4] H01R *11/00*

U.S. Cl. 439—595 **9 Claims**



9. In an electrically insulated connector housing having at least one passage for accommodating a terminal therein which extends parallel to a longitudinal axis of the housing and having retainer means provided in the housing for the engagement with the terminal for preventing it from being withdrawn

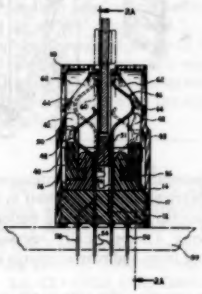
rearwardly from the passage in which it has been completely inserted; the housing comprised of a window provided in an outer circumferential wall of the housing and opened to said at least one passage; holding means, operable independently of said retainer means, disposed within said window, for lockingly engaging a part of the terminal when said terminal is completely inserted in the passage, said holding means comprising a projection of a dimension smaller than the window and connected at its lower part to a rim of the window by a resilient hinge extending from sad rim substantially in parallel with the longitudinal axis of the housing, said projection being operable from its inactive position where it is sustained by the horizontally extending hinge so as to stand vertically over and apart from the window and to its operative position where it is engaged with the part of the terminal for sharing the prevention of rearward withdrawal movements of the terminal with the retainer means by its substantially vertical downward movement accompanied with the resilient flection of the hinge of an angle of less than a right angle.

4,705,338

ZERO INSERTION FORCE CONNECTOR

Fred C. Sitzler, Dillsburg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 13, 1985, Ser. No. 808,926
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—260 **6 Claims**



1. A zero insertion force connector for connecting the edge of a printed circuit card to a circuit board, having

(a) opposed rows of elongated terminals having

(i) shank portions which extend through a terminal block and present rows of projecting tails below the block adapted for connection to the circuit board,

(ii) outwardly bowed portions above the block, and

(iii) contacts at their upper free ends, and

(b) two cams extending lengthwise of said rows, one for each row of terminals, and an elongated cam follower for each row of terminals, each follower being positioned outside the rows and beneath the bowed portions of the terminals in one row and being adapted to engage the bowed portions when the follower is raised by the cam and to force the contacts in the two rows toward each other and into wiping contact with the edge of a printed circuit card placed between the rows.

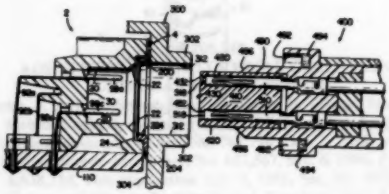
characterized in that the cam followers are enclosed within a one-piece non-moving housing having side walls attached to the sides of the terminal block and having top and end walls which are slotted to receive the card, the terminals emerge from the top surface of the terminal block in two rows, and the cams are longitudinally movable within longitudinal channels defined by the rows of terminals, the housing and the top surface of terminal block.

4,705,339

SEALED PLUG FOR A PRINTED CIRCUIT BOARD RECEPTACLE

Earl J. Hayes, Advance, and Ralph M. Cooper, Clemmons, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 19, 1986, Ser. No. 876,525
Int. Cl.[4] H01R *13/432*
U.S. Cl. 439—277 **12 Claims**



1. A plug for interconnecting to a receptacle, the plug comprising:

a plug housing having a central portion including an insert receiving cavity therein, the cavity being defined by an inner peripheral surface and a back wall, the housing further comprising a first plurality of contact receiving apertures extending substantially between a rear contact receiving face of the central portion and the back wall within the cavity;

an insert profiled for receipt in said insert receiving cavity having a front and back planar surface and a second plurality of contact receiving apertures spaced as said first plurality of contact receiving apertures extending between said front and back planar surfaces, and a contact locating means disposed in each of said second plurality of contact receiving apertures, the insert and housing cooperatively comprising means for providing a gap therebetween;

a sealing means located adjacent and planar to the rear contact receiving face, having apertures aligned with said first and second contact receiving apertures;

and a plurality of electrical contact means profiled for axial placement through said sealing means and housing rear contact receiving face, into said first plurality of apertures and extending into said second plurality of apertures, the contact means comprising a mating end and a wire terminating end, the contact means further comprising an integral locking lance extending transversely of said contact means axial direction movable from a locked position extending outside of an envelope of the contact means, to an insertable position where the lance is within the envelope of said contact means, whereby

when the lance of said contact means is in the insertable position and the contact means is inserted through the first and second contact receiving apertures until the mating end of said contact means abuts the contact locating means of said insert and the locking lance is moved to the locked position, the lance extends into the gap between the insert and housing, thereby locking the contact means in place.

4,705,340

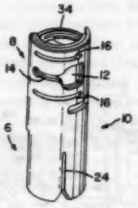
INSULATION DISPLACING BARREL TERMINAL

Winfield W. Loose, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 810,794, Dec. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 672,554, Nov. 19, 1984, abandoned. This application Oct. 22, 1986, Ser. No. 922,836

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—395 30 Claims



1. An insulation displacement type terminal for terminating a conductor of an insulated wire thereto, comprising:

a spiralled cylinder stamped from conductive material and having continuous first and second adjacent layers defining a tubular wall, said cylinder having a first wire receiving entry through the wall of the cylinder which is in communication with a first slot that partially extends circumferentially around the terminal, and

a cap having an annular wall, the cap being slidably receivable over the cylinder and rotatable with respect thereto, having an opening adjacent to and alignable with the first said wire receiving entry,

whereby, when the cap is placed over the terminal such that the cap opening is aligned with the first said wire entry, and the wire is placed through both the cap opening and the first said wire receiving entry, rotation of the cap relative to said terminal, terminates the conductor of said wire within the slot in the terminal.

4,705,341

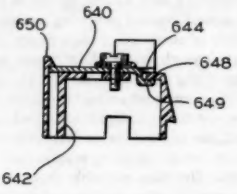
TERMINAL STRUCTURE FOR A COIL

James P. Schmiedel, Brown Deer, and Lawrence D. Moye, Shorewood, both of Wis., assignors to Square D Company, Palatine, Ill.

Filed Apr. 9, 1985, Ser. No. 721,983

Int. Cl.[4] H01R *13/422*

U.S. Cl. 439—544 7 Claims



1. A terminal assembly for a coil comprising:

a housing made of molded insulating material;

a lug made of electrically conducting material and having at least three fingers protruding from a first end;

a support molded into said housing for supporting said lug, and said lug being capable of rotation about said support;

a shelf, said shelf having a first surface and a second surface, said shelf capable of accepting at least one of said at least three fingers along said first surface, said shelf capable of accepting at least two of said at least three fingers along said second surface, and said at least three fingers touch said shelf and prevent said first end of said lug from rotating about said support;

a hook molded into said housing for securing a second end of said lug for preventing rotation of said lug about said support in order to secure said lug to said housing.

4,705,342

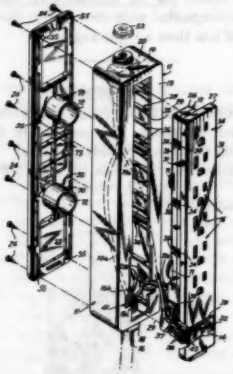
ELECTRICAL EXTENSION OUTLET

Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.

Filed Nov. 12, 1985, Ser. No. 797,277

Int. Cl.[4] H01R *21/00*

U.S. Cl. 439—650 15 Claims



1. An easily assembled electrical extension outlet having a multiplicity of electrical sockets disposed in seriatim about an elongated base member, said extension outlet comprising:

a housing having a substantially rectangular shape and means defining front and rear apertures and blind fastener receptacles;

a rear plate for covering the rear aperture of said housing, said rear plate being affixable to said housing by means of fasteners which extend into said blind fastener receptacles;

a base member having means for snap fastening said base member into said front aperture of said housing, said base member having a flange extension that extends over said front aperture, said base member having a top surface containing a multiplicity of socket holes defining a number of individual sockets, said base member containing in isolation wiring and contact means for establishing isolated electrical connection to each individual socket;

a switch disposed in said top surface of said base member and electrically connected to each individual socket, said switch having means for snap fastening said switch into said base member;

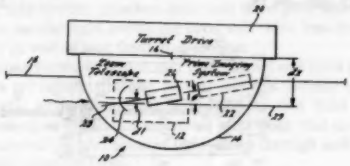
a power cord entering into said housing; and

a circuit breaker disposed within said housing and electrically connected between said power cord and said switch, said rear plate having means defining rear plate apertures for receiving wall mounting fasteners, said rear plate having means for electrically isolating said rear plate apertures, whereby said wall mounting fasteners do not come into contact with internal wiring, said means for isolating said rear plate apertures comprising cylindrical wells integrally formed in said rear plate, each well surrounding a respective rear plate aperture, and wherein said base member has internal flanges for covering each cylindrical well.

4,705,343
INFRARED ZOOM TELESCOPE WITH DECENTERED DOME

David R. Simons, Torrance, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 23, 1986, Ser. No. 855,039
Int. Cl.[4] G02B 13/14
U.S. Cl. 350—1.3 19 Claims



1. A method of imaging a scene from an aircraft, said method comprising:

mounting a dome of optical material to an aircraft such that the center of curvature thereof is inboard of the outer skin of the aircraft;

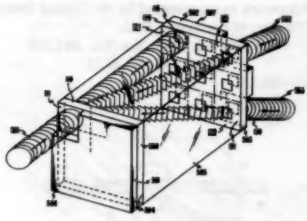
locating a zoom telescope having an objective lens and a zoom lens group within the dome such that the centers of curvature of the dome and the objective lens are decentered with respect to a common axis defined by an imaginary line parallel to the optical centered axes of both the dome and the objective lens; and

tilting the optical axis of the lenses of the zoom lens group with respect to the common axis whereby the tilt of the optical axis of the zoom lens group and the decenter of the objective lens compensate for the aberrations introduced by the decentered dome.

4,705,344
OPTICAL INTERCONNECTION ARRANGEMENT

Harvard S. Hinton, and John L. Ostrander, both of Naperville, Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 19, 1984, Ser. No. 683,716
Int. Cl.[4] G02B 5/32; G06G 9/00
U.S. Cl. 350—3.73 31 Claims



1. An interconnection device for optically interconnecting a plurality of optical devices, comprising:

a photosensitive material having an optical fringe pattern formable therein; and

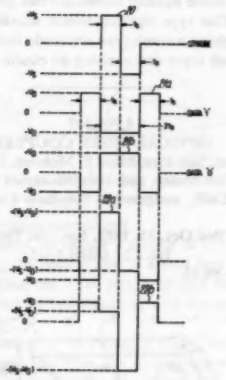
an optically transparent spacer material having oppositely facing first and second surfaces for maintaining said photosensitive material and said optical devices in a fixed relative position, said photosensitive material being fixedly positioned on said first surface, said second surface having a plurality of positions for fixedly positioning said optical devices thereon;

said optical fringe pattern being formed within said photosensitive material by directing a first coherent light beam through said photosensitive material and said transparent spacer material to a first one of said positions and by directing a second coherent light beam from a second one of said positions through said transparent spacer material to interfere with said first coherent light beam within said photosensitive material, said formed fringe pattern being effective for subsequently reflecting another light beam optically interconnecting said first and said second positions.

4,705,345
ADDRESSING LIQUID CRYSTAL CELLS USING UNIPOLAR STROBE PULSES

Peter J. Ayliffe, Stansted, and Anthony B. Davey, Stortford, both of England, assignors to STC PLC, London, England

Continuation-in-part of Ser. No. 782,796, Oct. 2, 1985, which is a continuation-in-part of Ser. No. 647,567, Sep. 6, 1984, Pat. No. 4,638,310. This application Apr. 2, 1986, Ser. No. 847,347
Claims priority, application United Kingdom, Apr. 3, 1985, 8508712
Int. Cl.[4] G02F 1/137; G09G 3/36
U.S. Cl. 350—350 S 8 Claims



1. A method of addressing a matrix-array type liquid crystal cell having a ferroelectric liquid crystal layer whose pixels are defined by the areas of overlap between the members of a first set of electrodes on one side of the liquid crystal layer and the members of a second set on the other side of the layer, in which method:

(a) the pixels are addressed on a line-by-line basis after erasure,

(b) unipolar blanking pulses are applied to the members of the first set of electrodes whereby erasure is effected.

(c) unipolar strobing pulses are applied serially to the member of the first set of electrodes while charge balanced bipolar data pulses are applied in parallel to the members of the second set, the positive going parts being synchronized with the strobe pulse for one data significance and the negative going parts being synchronized with the strobe pulse for the other data significance, whereby the pixels may be selectivly addressed, and

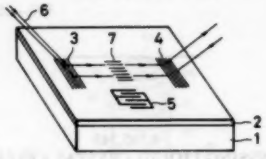
(d) the polarities of the strobe and blanking pulses are periodically reversed, whereby charge balance for the individual members of the first set of electrodes may be provided.

4,705,346

THIN FILM TYPE OPTICAL DEVICE

Mamoru Miyawaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1985, Ser. No. 733,368
Claims priority, application Japan, May 17, 1984, 59-100298
Int. Cl.[4] G02B 6/12
U.S. Cl. 350—96.14 6 Claims



1. A thin film type optical device comprising:
a substrate formed of lithium niobate crystal or lithium tantalate crystal; and
a light waveguide path layer comprising protons introduced into the surface of said substrate in exchange for the lithium atoms in said crystal and having a refractive index higher than that of said substrate, the absorption peak of the infrared absorption spectrum of OH radical by the protons in said light waveguide path layer existing in the range of wave number 3480 cm^{-1} to 3503 cm^{-1}.

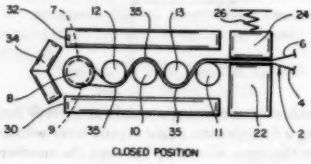
5. A thin film type optical device according to claim 1, further comprising a comb type electrode formed on said light waveguide path layer and exciting an elastic surface wave.

4,705,347

OPTICAL FIBER COUPLER

Nelson M. Shen, San Jose; Marc F. Moisson, Los Altos; John P. Arrington, San Mateo, and AbdulMohamed Tayeb, San Leandro, all of Calif., assignors to Raychem Corp., Menlo Park, Calif.

Filed Oct. 31, 1985, Ser. No. 794,342
Int. Cl.[4] G02B 6/26
U.S. Cl. 350—96.15 7 Claims



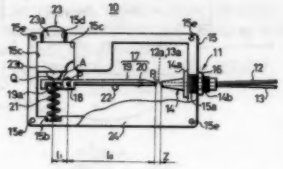
1. An optical coupler for withdrawing light from an optical fiber comprising a core surrounded by a cladding surrounded by a buffer, the buffer protecting the core and cladding from moisture, comprising:
at least one first post;
at least one second post;
first means for mounting the at least one first post thereon;
second means for mounting the at least one second post thereon, the first and second means being movable relative to one another;
a retaining post, an intermediate portion of the optical fiber being wound around the retaining post such that an in-going section of the optical fiber and an out-going section of the optical fiber are both wrapped around each of the one first and second posts and bent therearound; and
detector means for detecting light emitted from the optical fiber bent by the one first and second posts.

4,705,348

OPTICAL SWITCH

Hiroshi Matsunaga; Ichiro Tokunaga; Yoji Shimojima, all of Furukawa, and Kosei Obata, Miyagi, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Mar. 8, 1984, Ser. No. 587,390
Claims priority, application Japan, Mar. 9, 1983, 58-37320
Int. Cl.[4] G02B 6/32
U.S. Cl. 350—96.15 2 Claims



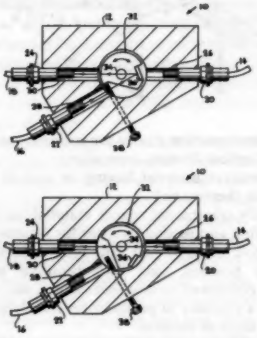
1. An optical switch comprising:
an optical fiber member having a light sending fiber and a light receiving fiber whose ends are arranged close together;
a reflecting surface movable to a position adjacent said ends of said fiber for reflecting light from the light sending fiber end to the light receiving fiber end in an ON state of the switch and to a position wherein it does not reflect light from the light sending fiber end to the light receiving fiber end in an OFF state of the switch; and
a lever, which is pivotable about a fulcrum at an intermediate position thereof, having an elongated length and said reflecting surface provided at one end thereof on an edge perpendicular to its elongated length arranged in opposing relation to said optical fiber member, and switch actuating means at the other end thereof for pivoting said other end of said lever such that said reflecting surface on said one end is moved between said ON and OFF states, wherein the distance from said actuating means to said fulcrum is shorter than the distance from said fulcrum to said reflecting surface.

4,705,349

OPTICAL SWITCH

Robert P. Reedy, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 18, 1985, Ser. No. 692,760
Int. Cl.[4] G02B 6/26
U.S. Cl. 350—96.15 4 Claims



1. An apparatus for selectively optically switching either

light leaving a first glass fiber, or light leaving a second glass fiber, into a third glass fiber, the apparatus comprising:

a first lens system, attached onto said first glass fiber, to collimate the light leaving said first glass fiber into a first parallel beam of light;

a second lens system, attached onto said second glass fiber, to collimate the light leaving said second glass fiber into a second parallel beam of light;

a third lens system, attached onto said third glass fiber, to focus parallel light impinging upon said third lens system upon an end of said third glass fiber;

a mounting fixture to which said first, second and third glass fibers are rigidly attached, so that said first parallel beam of light, when unimpeded, is focused by said third lens system upon the end of said third glass fiber, and so that said second parallel beam of light passes through said first parallel beam of light;

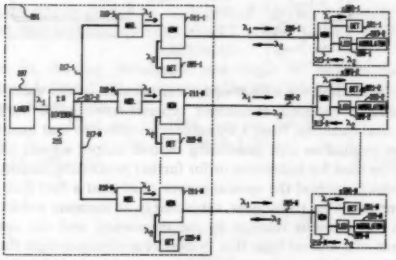
a planar mirror; and

a rotatable table, rotatably mounted upon said mounting fixture, to which said planar mirror is rigidly attached, whereby said mirror may repeatably take either a first position, where said mirror impedes said first parallel beam of light thereby preventing it from being focused by said third lens system upon the end of said third glass fiber and, at the same time, reflects said second parallel beam of light so that it is focused by said third lens system upon the end of said third glass fiber, or a second position, where said mirror does not impede said first parallel beam of light and does not reflect said second parallel beam of light, so that by selectively rotating said planar mirror into said first position or said second position, the selective optical switching of light from said second glass fiber into said third glass fiber, or of light from said first glass fiber into said third glass fiber, respectively, is achieved.

4,705,350
OPTICAL TRANSMISSION NETWORK

Steven S. Cheng, Bernards Township, Somerset County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Sep. 19, 1985, Ser. No. 777,952
Int. Cl.[4] G02B *6/36*; H04B *9/00*
U.S. Cl. 350—96.16 **12 Claims**



1. An optical transmission network comprising:

a central office,

a plurality of user stations, and

a plurality of bidirectional optical transmission paths for connecting said central office with each of said user stations,

said central office comprising:

a coherent light source for emitting coherent radiation to accommodate high-capacity, wide bandwidth data requirements,

power dividing means for dividing said coherent radiation over said transmission paths for transmitting said coherent radiation from said central office to said user stations,

modulating means associated with each of said transmission paths for modulating high-capacity, wide bandwidth information onto said coherent radiation transmitted from said central office to said user stations, and

detector means associated with each transmission path for detecting radiation transmitted from said user stations to said central office; and

each of said user stations comprising,

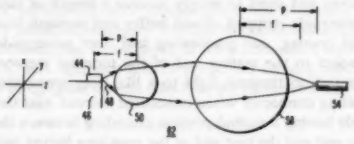
a detector for detecting the information modulated onto said coherent, high-capacity, wide bandwidth radiation transmitted from said central office, and

a light emitting diode for transmitting low-capacity, narrow bandwidth information-bearing radiation to said central office.

4,705,351
TWO LENS OPTICAL PACKAGE AND METHOD OF MAKING SAME

Minoru Toda, Princeton Junction, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 26, 1985, Ser. No. 801,828
Int. Cl.[4] G02B *6/32*
U.S. Cl. 350—96.18 **21 Claims**



1. An optical package comprising

a first lens assembly, including a source of divergent light, disposed along the optical axis of a first lens at an object distance less than the focal length of said first lens such that a magnified virtual image of said source is formed; and

a second lens assembly including a body, having a light acceptance angle less than the divergence angle of said light source, disposed along the optical axis of a second lens, which axis is common with the axis of said first lens, at an object distance greater than the focal length of said second lens such that a magnified real image of said body is formed;

wherein said images substantially correspond in position along said common axis.

20. A method for coupling light from a source of divergent light into an optical fiber, having an acceptance angle less than the divergence angle of said source, comprising the steps of

forming a first lens assembly by fixing the source along the optical axis of a first lens such that the object distance is less than or equal to the focal length of said first lens, thereby forming a magnified virtual image of the source;

forming a second lens assembly by fixing an end of said optical fiber along the optical axis of a second lens such that the object distance is greater than the focal length of said second lens thereby forming a magnified real image of the fiber end; and

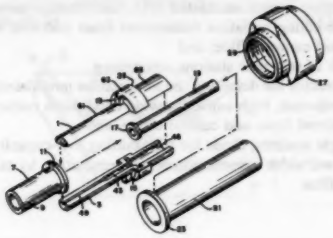
coupling the light from said source into said fiber end by placing the optical axes of the first and second assemblies along a common axis and aligning the magnified virtual image of the source with the magnified real image of the fiber end.

4,705,352

FIBER OPTIC CONNECTOR

Mark Margolin, and Igor Grois, both of Lincolnwood, Ill., assignors to Amphenol Corporation, Wallingford, Conn.

Filed Dec. 30, 1985, Ser. No. 818,576
Int. Cl.[4] G02B 6/36, 7/26
U.S. Cl. 350—96.20 15 Claims



1. A fiber optic connector for coupling a fiber optic cable, said caable having an outer coating about a strength layer which in turn surrounds a buffer layer surrounding a fiber waveguide, and said connector comprising:

(a) a clamp member terminal defined by a pair of matching halves having complementary V-shaped groove means defining a through-hole extending axially therethrough, said through-hole having a first portion extending between forward mating end portions of said matching halves and sized to snugly receive a length of said fiber waveguide stripped of said buffer and strength layer and said coating, and positioning said fiber waveguide with respect to the mating end of the terminal member at a position to transmit light to a like fiber terminated in a mating connector when connected thereto, said through-hole having a second portion extending between the mating end and the rear end of the matching halves and sized to snugly receive a length of said waveguide surrounded only by said buffer layer and said through-hole having a third portion located at the rear end of the matching halves and sized to receive a tube member therein;

(b) a tube member having a diameter sufficient to permit said buffer covered waveguide length to pass therethrough, having engaging means for engaging both said pair of matching halves immobile with respect to each other both in the longitudinal as well as the transverse direction, and said tube member being of sufficient length to extend for a length out the rear of said matching halves;

(c) outer sleeve crimp means of a size sufficient for being received over the rear of said matching halves and for being crimped onto the outside of said cable for holding the outer coating and strength layer of said cable between said crimp means and said length of tube member extending out the rear of said matching halves;

(d) resilient clamp means slidable over the forward mating end portion of said matching halves for clamping said matching halves together to hold a fiber therein; and

(e) coupling means for connecting said fiber optic connector to effect said coupling of said fiber optic cable.

4,705,353

OPTICAL FIBER CABLE CONSTRUCTION

Joseph L. C. Wagoner, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Continuation of Ser. No. 479,779, Mar. 28, 1983, abandoned. This application Sep. 18, 1985, Ser. No. 778,279
Int. Cl.[4] G02B 6/44
U.S. Cl. 350—96.23 24 Claims

1. A communications cable comprising:

an optical fiber for transmitting optical signals therethrough;

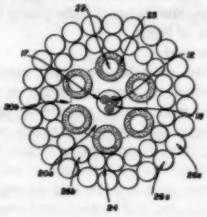
a first layer of cushioning material surrounding said fiber;

a first layer of protective material surrounding said first cushioning layer for imparting longitudinal stiffness thereto;

a protective jacket surrounding said first protective layer and in substantially continuous contact therewith, formed of a material and in a thickness selected to impart further longitudinal stiffness to the fiber;

a layer of armor strands formed into helixes surrounding said protective jacket; and

centering means between the outer surface of said jacket and said layer of armor for maintaining said fiber axially centered within the cable while cushioning the fiber against bending stress.

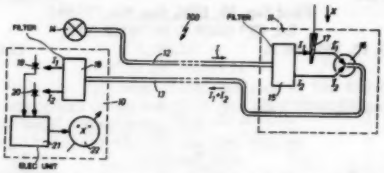


4,705,354

METHOD FOR FIBER OPTIC TRANSMISSION OF A SPECIAL CODED MEASUREMENT

Reinhard Ulrich, Buchholz, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 9, 1985, Ser. No. 764,073
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1984, 3429328
Int. Cl.[4] G01D 5/30
U.S. Cl. 350—96.29 33 Claims



1. A method for a fiber-optic transmission of the value of a spectrally encoded measurant representative of a variable physical quantity, from a transducer sensitive to that quantity, to an evaluation unit generating desired output signals which may be used for indication or for further processing, according to which method the optical power of at least a first flux I_1 is by means of the transducer, subjected to an intensity jodulation in a monotonous relation to the measurant, and the optical power of a second light flux I_2 used as a reference light flux, is by means of the evaluation unit, compared with said first light flux, whereby the desired output signal is generated as a signal characteristic of the power ratio of the two light fluxes, which by means of a fiber-optical arrangement are transmitted from the transducer to the evaluation unit, wherein both, the light flux I_1 and the light flux I_2 are transmitted from the transducer to the evaluation unit through one optical fiber forming the light path therebetween,

wherein both partial light fluxes I_1 and I_2 are generated each with distinctly different narrow-band line-structures of the spectral distributions of their optical powers, in such a manner, that a line of one of the two light fluxes is spectrally interposed between two lines of the other light flux,

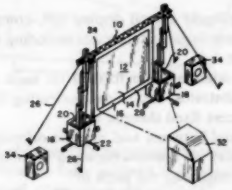
with a spectral interspersing of the light fluxes I_1 and I_2 resulting therefrom, and the spectral separation of adjacent lines of these light fluxes being greater than the linewidths of those lines, and wherein the optical powers of the spectrally interspersed light fluxes I_1 and I_2, for the purpose of comparing these optical powers in the evaluation unit, are measured individually after spectral separation from each other by means of filters which are selective to the specific sppectral distributions of the light fluxes I_1 and I_2.

4,705,355

MOTION PICTURE SCREEN ASSEMBLY

Andrew M. Espo, Dedham, Mass., assignor to Creative Talent, Inc., Boston, Mass.

Filed Sep. 12, 1986, Ser. No. 906,998
Int. Cl.[4] G03B *21/56*
U.S. Cl. 350—117 **18 Claims**



1. A portable motion picture screen assembly comprising:
(a) a horizontal support beam;
(b) a motion picture viewing screen detachably fastened at its upper edge to said horizontal support beam; and
(c) at least one vertical ram detachably affixed adjacent its upper end to said horizontal support beam, said ram operating to raise said support beam causing said viewing screen to assume a vertical viewing orientation, said ram also operating to lower said support beam causing said viewing screen to assume a non-vertical non-viewing position.

4,705,356

THIN FILM OPTICAL VARIABLE ARTICLE HAVING SUBSTANTIAL COLOR SHIFT WITH ANGLE AND METHOD

Peter H. Berning, Sebastopol, and Roger W. Phillips, Santa Rosa, both of Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Jul. 13, 1984, Ser. No. 630,414
Int. Cl.[4] G02B *5/28*
U.S. Cl. 350—166 **28 Claims**

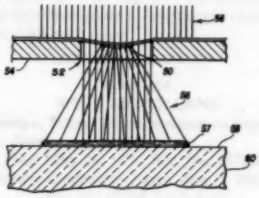
1. In a thin film optically variable article having substantial color shift with varying angle of light incidence and viewing, an optically thick substantially transparent structural element carrying a colorant and having first and second surfaces and a multilayer interference coating carried on one of said first and second surfaces, said colorant being external of the multilayer interference coating, said colorant serving to modify in essentially a subtractive mode the color at normal incidence and the color shift with angle of the multilayer interference coating as seen by transmission of light through the article.

4,705,357

SHADOW MASK HAVING APERTURE OCCLUSION PREVENTION MEANS

Leonard Dietch, Skokie, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 22, 1985, Ser. No. 768,522
Int. Cl.[4] G02B *27/00*; G03B *41/00*
U.S. Cl. 350—322 **8 Claims**



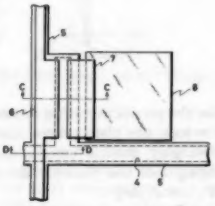
8. For use in the manufacture of a color cathode ray tube, a component-in-process comprising a shadow mask having a pattern of minute apertures for color selection, said mask having deposited on both surfaces thereof a removable film effective to prevent particle occlusion of said apertures, said film being characterized by having physically-related properties including non-flammability, static charge dispersibility, pyrolyzability, and dust rejection, said film being further characterized by having optically related properties including an extremely small, substantially uniform thickness dimension of 4 to 6 micro-inches, a low index of refraction, and a high transparency, said optically related properties causing the film to exhibit a negligible optical effect during photoscreening operations.

4,705,358

SUBSTRATE FOR ACTIVE MATRIX DISPLAY

Tsuneo Yamazaki; Shunichi Motte, and Masafumi Shimbo, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Jun. 10, 1985, Ser. No. 743,093
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—334 **9 Claims**



1. A substrate for an active matrix display comprising: an insulating substrate; insulated-gate-field-effect thin film transistors arranged in an X-by-Y matrix on said insulating substrate, each transistor comprising a gate electrode formed on said insulating substrate, a gate insulating film covering said gate electrode, a thin semiconductor film selectively formed on said gate insulating film, a source electrode and a drain electrode formed on said semiconductor film to define therebetween a channel region, and a transparent picture electrode formed in a region without said semiconductor film and connected to said drain electrode; gate signal lines elongated from said gate electrodes in an X direction and the overall portion of said gate signal lines at least in the area between said gate electrodes

being covered with said gate insulating film and said thin semiconductor film extended from said channel regions; and data signal lines elongated from said source electrodes in a Y direction and being formed on said semiconductor film disposed on said gate insulating film.

4,705,359

PROCESS AND APPARATUS FOR THE PRODUCTION OF AN ORIENTATION LAYER ON A PLANE SURFACE OF A PLATE, AND LIQUID CRYSTAL SUBSTRATE PLATE PRODUCED THEREBY

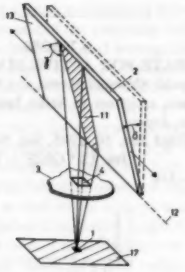
Hermann Amstutz, Meilingen; Meinolph Kaufmann, Baden; Jürgen Nehring, Wettingen, and Terry J. Scheffer, Forch, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 25, 1985, Ser. No. 704,775

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1984, 3407794; Jul. 4, 1984, 3424530

Int. Cl.[4] G02F *1/133*

U.S. Cl. 350—341 **10 Claims**



1. A process for the production of an orientation layer on a plane surface of at least one plate, where said plane surface is exposed to a diverging particle stream emanating from a source and impinging upon said plane surface under an angle of incidence $(\gamma) \neq 0°$, comprising:

providing a plate having a smooth surface.

introducing an aperture screen with an aperture between the source and the plate;

displacing the plate and the source relative to each other from a first position to a second position with approximately a constant velocity in a displacement direction that is parallel to said plane surface and substantially crosswise to the direction of the particle stream; and

emanating through said aperture a particle stream from said source upon said smooth surface, said particle stream having a field limited on both sides in the displacement direction in such a way that the surface of the plate lies outside of the limited particle stream in the first and second positions and passes through the particle stream during the course of the displacement.

4,705,360

LIQUID CRYSTAL DISPLAY CELL AND METHOD FOR MANUFACTURING THEREOF

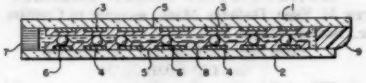
Fumiaki Funada, Yamatokoriyama; Hiroshi Kuwagaki, Joyo; Kunihiko Yamamoto, Nara, and Masataka Matsuura, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 545,214, Oct. 25, 1983, abandoned. This application Jul. 5, 1985, Ser. No. 752,007

Claims priority, application Japan, Oct. 29, 1982, 57-191283; Nov. 8, 1982, 57-196630

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—344 **24 Claims**



1. A flexible liquid crystal display cell, comprising:

top and bottom organic substrates including transparent film electrodes;

an organic orienting film formed on each of the top and bottom substrates, one of said orienting films having organic spacers fixed therein; and

a liquid crystal between said organic orienting films.

19. A method of manufacturing a flexible liquid crystal display cell, comprising the steps of:

(a) applying an organic orienting film solution to first and second flexible organic substrates including transparent film electrodes forming first and second organic orienting films thereon;

(b) scattering organic spacers on one of the first or second flexible organic substrates;

(c) curing said first and second organic orienting films and immobilizing the organic spacers on the one of the first or second flexible organic substrates at a temperature less than the melting point of the organic spacers; and

(d) joining and sealing the first and second flexible organic substrates, and introducing liquid crystals into a separation formed between the first and second flexible organic substrates by the organic spacers.

4,705,361

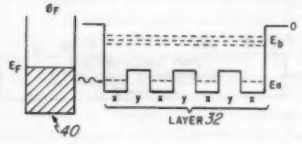
SPATIAL LIGHT MODULATOR

Gary A. Frazier, Garland; William R. Frensley, Richardson, and Mark A. Reed, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 27, 1985, Ser. No. 802,637

Int. Cl.[4] G02F *1/015*

U.S. Cl. 350—355 **20 Claims**



1. A light modulator, comprising:

(a) a stack of alternating first and second quarter wavelength thick plates, said first plates each including alternating layers forming quantum wells and tunneling barriers with the ground levels in said wells of substantially the same energy: and

(b) at least one electrode for injecting or withdrawing carriers from said ground levels in said wells, whereby light is absorbed by excitation of carriers in said ground levels to

higher levels and light transmitted by a depletion of carriers from said ground levels.

4,705,362

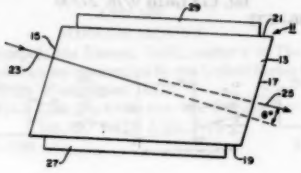
ACOUSTO-OPTIC TUNABLE FILTER WITH TWO ACOUSTIC CHANNELS

Frederick M. Ryan, Loyalhanna Township, Westmoreland County; Milton Gottlieb, Churchill Boro, and Donald W. Feldman, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 657,925, Oct. 5, 1984, abandoned. This application Jul. 2, 1986, Ser. No. 881,579

Int. Cl.[4] G02B *5/20*; G02F *1/11*

U.S. Cl. 350—372 **2 Claims**



1. A method of extending the tuning range of a non-collinear acousto-optic tunable filter without a corresponding increase in the size thereof, comprising the steps of:

introducing incident light into the acousto-optic tunable filter comprising a crystal having an optical input face which is normal to said incident light, an optical output face which is normal to a selected diffracted passband of said incident light, and first and second parallel sides;

selectively launching acoustic waves having a center frequency f_1 into said crystal from said crystal first side, which acoustic waves are propagating in a first direction so that interaction with said incident light results in the absorption of a phonon; and

selectively launching acoustic waves having a center frequency f_2 into said crystal from said crystal second side, which acoustic waves propagate in a second direction which is anti-parallel to said first direction such that interaction with said incident light results in the stimulated emission of a phonon, wherein the interaction of the acoustic waves with said incident light distinguishes the selected passband of said incident light from the remaining incident light through diffraction of the selected passband of incident light relative to the remaining incident light.

4,705,363

ABERRATIONAL DETERIORATION PREVENTED ZOOM LENS

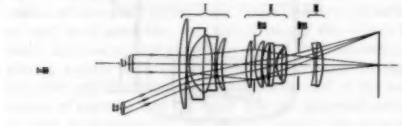
Keiji Ikemori, Yokohama, Japan, assignor to Canon Kabushiki Kaisha

Filed Nov. 27, 1984, Ser. No. 675,338

Claims priority, application Japan, Nov. 29, 1983, 58-225067; Feb. 16, 1984, 59-27567

Int. Cl.[4] G02B *15/14*

U.S. Cl. 350—427 **17 Claims**



1. A zoom lens comprising:

at least two lens groups movable along an optical axis for zooming, the rear one of said lens groups including a lens unit;

an aperture diaphragm of variable size arranged on the object side of said lens unit to determine the F-number of the entire system; and

light limiting means for limiting light flux arranged on the image side of said lens unit to be axially movable and occupying a position substantially coincident with the position at which when in the telephoto side of zooming, the full open on-axial ray and the marginal ray of the off-axial light flux going to the margin of an image frame intersect with each other.

4,705,364

WIDE ANGLE LENS

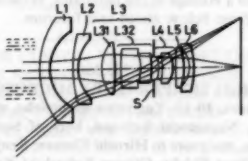
Koichi Wakamiya, Tokyo, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed May 28, 1986, Ser. No. 867,692

Claims priority, application Japan, Jun. 5, 1985, 60-121753

Int. Cl.[4] G02B *9/62, 9/64*

U.S. Cl. 350—463 **7 Claims**



1. A wide angle lens comprising six lens components arranged successively from the object-side with a stop between the third and the fourth components, wherein the first component has a concave surface on the image-side, the second component is a negative meniscus lens with its convex surface on the object-side, the third component includes a positive lens having a convex surface on the object-side, the fourth component is a meniscus lens with its concave surface on the object-side, the fifth component is a positive lens having a convex surface on the image-side and the sixth component is a negative meniscus lens with its convex surface on the image-side, and these components satisfy the conditions:

$0.5 < \phi_2/\phi_6 < 1.4$

$0.8f < f_3 < 1.5f$

$< 0\ f/f_R < 0.5$

$0.8f < r_2 < 1.5f$

wherein, f is the focal length on the image side of the whole system;

ϕ_2 is the refractive power of the second component;

ϕ_6 is the refractive power of the sixth component;

f_3 is the focal length of the third component;

f_R is the composite focal length of the fourth, the fifth and the sixth components; and r_2 is the radius of curvature of the image-side surface of the first component.

4,705,365

LIGHT DEFLECTING APPARATUS

Naomasa Wakita, and Makoto Okuda, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Dec. 2, 1985, Ser. No. 803,734

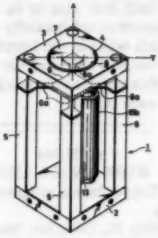
Claims priority, application Japan, Dec. 1, 1984, 59-254813; Dec. 6, 1984, 59-258170

Int. Cl.[4] G02B *26/08*

U.S. Cl. 350—487 **2 Claims**

1. A light deflector comprising: a supporting member, a fulcrum disposed on said supporting member, a reflective mirror having a specular surface on top, a flexible supporting plate that is retained along its periphery and engages said

fulcrum substantially at the center of said plate, said plate for supporting said reflective mirror from below in an oscillatory manner, a pair of piezoelectric laminates being disposed at locations on x- and y-axes that pass through the fulcrum, said x- and y-axes intersecting at right angles in a plane, and being



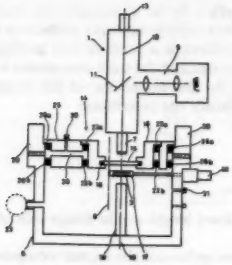
disposed at a distance from said fulcrum, said piezoelectric laminates being capable of expansion and contraction in a z-axis direction that is perpendicular to said x- and y-axes upon application of a voltage to the laminates, to oscillate said reflective mirror from below about said fulcrum.

4,705,366

HIGH TEMPERATURE MICROSCOPE

Hiroshi Kimura, 10-10, Yagiyama-kasumicho, and Kenji Abiko, 102, 2-31, Nagamachi 8-chome, both of Sendai-shi, Miyagi 982, Japan, assignors to Hiroshi Kimura; Kenji Abiko, both of Sendai; Nihon Shinku Gijutsu Kabushiki Kaisha, Chigasaki and Olympus Optical Company Limited, Tokyo, all of, Japan

Division of Ser. No. 698,828, Feb. 6, 1985, Pat. No. 4,643,531.
This application May 27, 1986, Ser. No. 867,478
Claims priority, application Japan, May 24, 1985, 60-110190
Int. Cl.[4] B02B *21/24, 5/00, 7/00*
U.S. Cl. 350—529 **9 Claims**



1. A high temperature microscope having a peep window provided in a chamber, comprising:

a first flange provided in said chamber and surrounding the outer periphery of said peep window via a sealing ring member;

a second flange provided in said chamber and surrounding the outer periphery of said first flange via a sealing ring member; and

a third flange secured to said chamber and surrounding the outer periphery of said second flange via a sealing ring member;

said second flange being rotatable about a stationary axis parallel to and spaced apart from the optical axis of an objective lens;

said first flange being rotatable about an axis parallel to and spaced apart from the axis of rotation of said second flange;

wherein when said peep window becomes opaque due to deposition thereon of vapor generated from an object at a high temperature in the chamber so that the observation of the object can no longer be made, at least either one of said first and second flanges is rotated by a predetermined angle to remove the opaque portion of the peep window from the field-of-view, thus permitting observation of the object for a long period of time.

4,705,367

VARIABLE FOCAL LENGTH OPTICAL SYSTEM HAVING A CONSTANT DIAMETER FOCAL SPOT

Alan C. Eckbreth, Glastonbury, and John H. Stufflebeam, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 14, 1986, Ser. No. 863,213
Int. Cl.[4] G02B *9/16, 27/00*
U.S. Cl. 350—572 **4 Claims**

1. An optical system for focusing at least one collimated input optical beam traveling along an optical axis to a focal spot of constant size at a variable probe distance along said optical axis comprising;

a diverging input lens q_1 having a first focal length f_1 and being separated by a first variable separation distance s_1 along said optical axis from a converging second lens q_2, having a second focal length f_2 and being separated by a second separation length s_2 along said optical axis from a third lens having a third focal length F;

characterized in that said second separation length separating said second lens from said third lens is substantially equal to the sum of said second and third focal lengths;

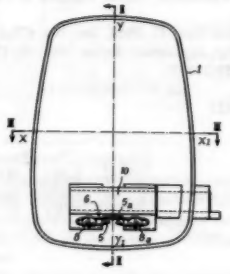
and in that said first separation length separating said first and second lenses is a variable separation length, whereby said variable probe distance varies as a function of said first variable separation length.

4,705,368

ANTI-VIBRATION DEVICE FOR VEHICLE REARVIEW MIRROR

Stéphane Manzoni, Saint-Claude, France, assignor to Manzoni-Bouchot, France

Filed Feb. 18, 1986, Ser. No. 830,222
Claims priority, application France, Feb. 22, 1985, 85 02580
Int. Cl.[4] B60R *1/02;* **G02B** *7/18*
U.S. Cl. 350—632 **7 Claims**



1. In combination with a rearview mirror device of the type

having a housing mounted to a vehicle, a reflective member, and support means for supporting said reflective member, said support means having a rear face and being pivotally mounted to said housing for pivoting said reflective member about two perpendicular axes, wherein the improvement comprises:

a dampening member slidingly mounted to said housing, said dampening member having a base portion and at least one resilient branch portion extending from said base portion; and

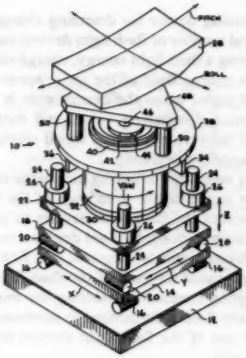
a boss portion extending perpendicular to said rear face of said support means in a direction towards said dampening member, said boss portion engaging said at least one resilient branch portion of said dampening member, said base portion being slidably mounted to said housing along an axis substantially perpendicular to said boss portion.

4,705,369

MIRROR MOUNT

Harold H. Humpal, San Ramon, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 21, 1986, Ser. No. 842,573
Int. Cl.[4] G02B *5/08, 7/18*
U.S. Cl. 350—636 **3 Claims**



1. A mount for supporting an object, in a manner allowing decoupled pitch, roll and yaw movement of the object, subject to the constraint that a first spatial point fixed in the rest frame of reference of the object, and a second spatial point fixed in the rest frame of reference of the mount, are maintained as coincident, said mount comprising:

a spherically annular shell assembly, rigidly attached to said object, having an inner concave spherical surface and an outer convex spherical surface, with the center of curvature of said inner concave spherical surface and the center of curvature of said outer convex spherical surface both being coincident upon said first spatial point, and with said spherically annular shell assembly having an internally disposed opening that passes between said inner concave spherical surface and said outer convex spherical surface;

a pedestal, extending through said opening, and having a convex spherical surface at one end thereof, of the same radius of curvature as the inner concave spherical surface of said shell assembly, and which snugly fits within the inner concave spherical surface of said shell assembly;

a clamp, rigidly attached to said pedestal, and having a concave spherical surface at one end thereof, of the same radius of curvature as the outer convex spherical surface of said shell assembly, and which snugly fits upon the outer convex spherical surface of said shell assembly;

a pair of pitch paddles, rigidly attached to said spherically annular shell assembly, and positioned so that the internally disposed opening of said shell assembly is generally located between said pair of pitch paddles;

a pair of roll paddles, rigidly attached to said spherically annular shell assembly, and positioned so that the internally disposed opening of said shell assembly is generally located between said pair of roll paddles, with the line of direction extending between said pair of roll paddles, and the line of direction extending between said pair of pitch paddles, being rigorously perpendicular;

means for moving said pair of pitch paddles so that only the pitch attitude, and not the roll attitude, of said object, is controlled;

means for moving said pair of roll paddles so that only the roll attitude, and not the pitch attitude, of said object, is controlled; and

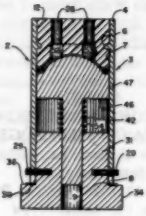
means for rotating said pedestal, to control the yaw attitude of said object, about an axis that is both stationary in the rest frame of reference of said mount and that passes through the center of curvature of the convex spherical surface of said pedestal, so that the center of curvature of the convex spherical surface of said pedestal is coincident upon both said second spatial point and said first spatial point.

4,705,370

APPARATUS FOR CUSTOM TINTING SOFT CONTACT LENSES BY DISPENSER OF LENSES

Carl S. Johnson, 2611 Telegraph Ave., Oakland, Calif. 94612

Filed Feb. 27, 1986, Ser. No. 834,203
Int. Cl.[4] G02C *7/04*; D06P *5/00*
U.S. Cl. 351—162 **11 Claims**



1. Apparatus for tinting contact lenses; comprising:

(a) a base member;

(b) a tubular housing detachably mounted on the base member;

(c) a sealing die closing and fixed within the end of said tubular housing remote from said base member and having a dye cavity therewithin adapted to receive the admission of an appropriate contact lens dye; and

(d) a pedestal slidably mounted within the housing adapted to conformably receive and support a contact lens to be tinted whereby selected areas of said contact lens sealingly impinge against said sealing die to seal said dye cavity whereby selected areas of said contact lens to be tinted are exposed to contact lens dye injected into said cavity.

4,705,371

3-D METHOD AND APPARATUS

Terry D. Beard, 1407 North View Dr., Westlake Village, Calif. 91362

Filed Oct. 10, 1986, Ser. No. 916,136
Int. Cl.[4] G03B *21/32*
U.S. Cl. 352—86 **24 Claims**

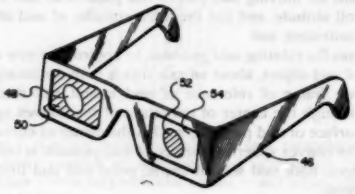
14. Viewer glasses for creating a stereoscopic effect when viewing an ordinary moving picture produced by a videotape, motion picture, video game or the like, in which at least portions of the scene exhibit a lateral movement, comprising:

first means for transmitting light from the moving picture to the viewer's right eye,

second means for transmitting light from the moving picture to the viewer's left eye,

the optical density of one of said light transmitting means being at least 0.3 darker than the optical density of the other light transmitting means, whereby one eye perceives a darker image than the other eye,

the darker light transmitting means having a spectral density gradient with a substantially higher transmissivity in the blue region than in the green or yellow regions, and



means for holding said light transmitting means in place on a viewer's face.

20. A method of creating a stereoscopic effect, comprising:

transmitting an image of a scene which includes lateral movement to one eye of a viewer, and

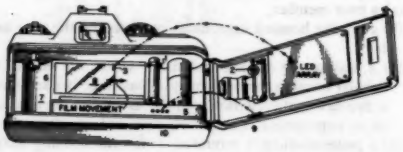
transmitting a darker image of the same scene to the viewer's other eye through a light filter which has a spectral density gradient with a substantially higher transmissivity in the blue region than in the green or yellow regions.

4,705,372

CAMERA FOR RECORDING KEYBOARD ENTRY OF DATA ON FILM EDGE

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed Oct. 10, 1986, Ser. No. 917,520
Int. Cl.[4] G03B *17/24*
U.S. Cl. 354—106 **12 Claims**



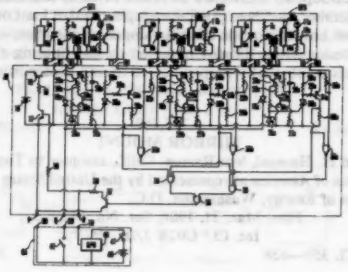
1. A compact camera for processing rolls of photographic film, comprising in combination, a light tight film processing compartment with an openable access cover for changing film rolls, a film viewing plane inside the camera defining a film frame to receive an exposure from a camera shutter mechanism and optic system when the cover is closed, means for moving the film on the rolls to present a series of film frames at said viewing plane, electronically programmable light emitting means mounted for exposing a predetermined linear portion of the film plane to photographically record thereon a plurality of data bits in response to electronic programming of the light emitting means, and electronic means for programming the data bits to record a line of coded data along the film frame in synchronism with movement of said film by said moving means to present the sequence of film frames at the viewing plane.

4,705,373

CHARGE COMPLETION CONFIRMING DEVICE FOR FLASH LIGHT DEVICES

Kouichi Ohmori, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1986, Ser. No. 912,965
Claims priority, application Japan, Oct. 1, 1985, 60-216229
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—127.11 **8 Claims**



1. A state confirming device for detecting charge completion states of a plural number of flash light devices each having a capacitor for storing a flash light energy, charge state detecting for detecting a charge state of the capacitor to deliver a charge completion signal when the charge state is at a level higher than a certain determined value, and mount signal forming means for delivering a mount signal when the flash light device is mounted, comprising:

(a) first detecting means for detecting the charge completion signal and the mount signal from each of the flash light devices for each of the flash light devices to produce an output when the mount signal is not detected or when the charge completion signal is detected, said first detecting means being provided for each of the flash light devices;

(b) second detecting means for detecting the mount signal from each of the flash light devices to produce an output when at least one of the flash light devices delivers the mount signal; and

(c) third detecting means for producing a signal indicating that all of the flash light devices mounted have been charged when all of the first detecting means are producing outputs while the second detecting means is producing an output.

4,705,374

TILTING VIEWFINDER AND VIDEO DOOR ACCESSORY FOR MOTION-PICTURE CAMERA

Kenneth W. Robings, Santa Monica, Calif., assignor to Clairmont Camera, Inc., Studio City, Calif.

Filed Sep. 11, 1986, Ser. No. 906,137
Int. Cl.[4] G03B *13/08*
U.S. Cl. 354—225 **27 Claims**

1. An accessory video door and tilt viewfinder for use with an ocular and with a video camera, and with a motion-picture camera which has a side, and which throws onto a ground glass in the motion-picture camera an inverted image of a scene; said accessory comprising:

a case adapted to be supported from such motion-picture camera adjacent to such ground glass, and to receive from such image light rays that are generally at a right angle to such side of the motion-picture camera;

an Amici prism, disposed within the case, for redirecting light rays from the image on the ground glass rearward within the case, with an inversion of the image;

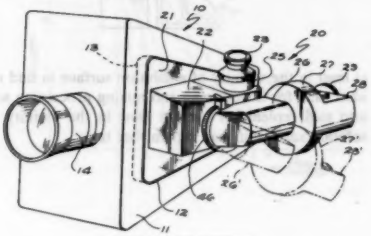
a video attachment port in the case, behind the Amici prism,

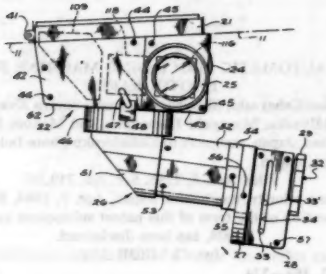
for attachment of such video camera to monitor such scene;

a beam splitter that passes part of the light from the Amici prism rearward to the video attachment port, and that deflects part of the light from the Amici prism outward from the case generally at a right angle to such side of the motion-picture camera;

a viewfinder tube having two ends, a first one of the ends being pivotally mounted to the case, for receiving the light rays deflected by the beam splitter;

an attachment port, defined at a second end of the tube, for mounting of such ocular;





a reflector within the tube near the first end, for intercepting the light rays deflected by the beam splitter and for redeflecting the intercepted light along a pivoting optical path, within the tube;

a relay lens within the tube for receiving the redeflected light from the reflector and relaying such image to a point near such ocular for viewing; and

a Pechan prism, rotatably secured within the tube, for counterrotating the relayed image in compensation for image rotation due to pivoting of the tube and reflector.

4,705,375

PAIR OF LIGHT SHIELDING FILM CASES FOR SURVEILLANCE CAMERA

Tadayuki Kirigaya, and Ichiro Taguchi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1986, Ser. No. 849,623
Int. Cl.[4] G03B *17/26*
U.S. Cl. 354—275 **4 Claims**

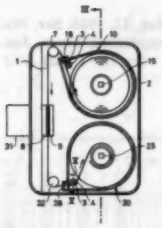
1. A pair of light-shielding film cases for a surveillance camera which are similar in configuration to each other and disposed adjacent one another in said camera, comprising:

a film supplying spool on which a film has been wound, said film supplying spool being accomodated within a first case body having a first cover;

a film winding spool on which said film, supplied from said film supplying spool, is wound, said film winding spool being accomodated within a second case body having a second cover;

at least one smooth roller rotatably fitted on a roller shaft and provided in each of said film cases;

a light-shielding member disposed in outlets of each said case body; and



a winding knob rotatably mounted on a respective one of said covers and serving as a spool bearing;

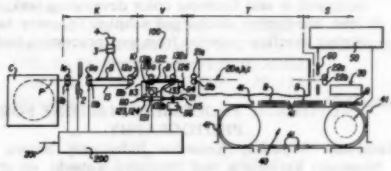
wherein film is passed through said light-shielding member while being kept in contact with said roller.

4,705,376

PROCESS AND APPARATUS FOR TREATING OBJECTS FORMING SEPARATE SERIES

Heiner Schaub, Wettingen, and Peter Bürki, Opfikon, both of Switzerland, assignors to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Aug. 18, 1986, Ser. No. 897,252
Claims priority, application Switzerland, Aug. 19, 1985, 3559/85
Int. Cl.[4] G03D *5/00*
U.S. Cl. 354—298 **20 Claims**



1. In a system wherein varying numbers of objects constitute a separate series of such object, an object treatment process comprising the following steps:

placing objects arriving on an input conveyor onto a plurality of output conveyors in accordance to a predetermined distribution pattern, including the step of

deviating from continuing with said predetermined distribution pattern upon encountering an object belonging to a different series, thus generating a separation mark on said output conveyors;

applying treatment to said objects on said output conveyors;

detecting said separation mark on said output conveyors;

collecting treated objects in said predetermined pattern from said output conveyors in response to detecting said separation mark;

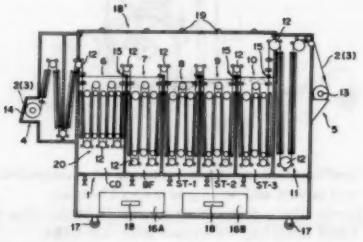
whereby objects belonging to different series may be separately collected.

4,705,377

AUTOMATIC PROCESSING MACHINE FOR LIGHT-SENSITIVE COLOR PHOTOGRAPHIC MATERIAL

Kazuhiro Kobayashi; Shigeharu Koboshi; Satoru Kuse; Kazuyoshi Miyaoka, and Masayuki Kurematsu, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 12, 1985, Ser. No. 753,958
Claims priority, application Japan, Jun. 18, 1984, 59-124637
Int. Cl.[4] G03D *3/02*
U.S. Cl. 354—322 **20 Claims**



1. A dipping type automatic processing machine for a light-sensitive color photographic material, comprising:

a plurality of processing tanks including a color developing tank containing a color developing solution as the foremost tank of the processing tanks, at least one fixing tank containing a fixing solution, and a stabilizing tank containing a stabilizing solution as the last tank of the processing tanks, said processing tanks comprising at least one divided tank;

at least two discharged solution recovery tanks, one of which is a tank for storing discharged solution from said color developing tank and the other of which is a tank for storing discharged solutions from the said fixing tank and said stabilizing tank in a mixture;

conveying means for conveying a light-sensitive material from one processing tank to a next processing tank, said conveying means excluding an endless belt-type conveyor so as not to bring stabilizing solution components from said last stabilizing tank into the color developing solution contained in said foremost color developing tank; and

at least one further discharged solution recovery tank for storing overflow solution from said processing tanks.

4,705,378

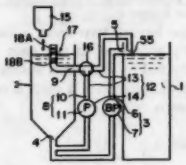
AUTOMATIC PROCESSING MACHINE FOR PHOTOGRAPHY

Kazuyoshi Miyaoka; Kazuhiro Kobayashi; Satoru Kuse; Masayuki Kurematsu, and Shigeharu Koboshi, all of Hino, Japan, assignors to Konishiroku Photo Ind. Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1985, Ser. No. 719,356
Claims priority, application Japan, Apr. 9, 1984, 59-69161
The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.
Int. Cl.[4] G03D *3/06*
U.S. Cl. 354—324 **14 Claims**

1. In an automatic processing machine for photography which automatically performs developing processing of a photographic light-sensitive material, comprising a processing solution tank; a replenisher tank for receiving and containing a replenisher solution; and means for supplying replenisher solution from said replenisher tank to said processing solution tank to replenish processing solution in said processing solution tank;

the improvement wherein said replenisher tank comprises means (10,11) for stirring and mixing the replenisher solution in said replenisher tank, said stirring means including a passage (10) communicating a bottom opening (4) of said replenisher tank (2) with a top opening (9) of said replenisher tank, and a pipe section (17) coupled to said top opening (9), said pipe section (17) having orifices therein



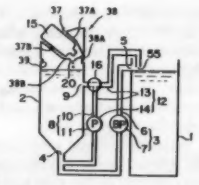
at least in the vicinity of a solution surface in said replenisher tank for introducing and mixing processing solution into said replenisher tank at least in the vicinity of the solution surface in said replenisher tank.

4,705,379

AUTOMATIC PROCESSING MACHINE FOR PHOTOGRAPHY

Kazuhiro Kobayashi; Shigeharu Koboshi; Satoru Kuse; Kazuyoshi Miyaoka; Masayuki Kurematsu, and Makoto Uchida, all of Hino, Japan, assignors to Konishiroku Photo Ind. Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1985, Ser. No. 719,367
Claims priority, application Japan, Apr. 9, 1984, 59-69158
The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.
Int. Cl.[4] G03B *3/06*
U.S. Cl. 354—324 **19 Claims**



1. In an automatic processing machine for photography which automatically performs developing processing of a photographic light-sensitive material, comprising a processing solution tank; a replenisher tank for receiving and containing a replenisher solution: and means for supplying replenisher solution from said replenisher tank to said processing solution tank to replenish processing solution in said processing solution tank;

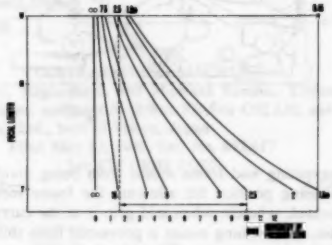
the improvement wherein said replenisher tank comprises means for circulating and stirring the replenisher solution in said replenisher tank, said circulating and stirring means including a jetting section for jetting a processing solution into said replenisher tand at least in the vicinity of the solution surface in said replenisher tank, said jetting section having jetting orifices at least in said vicinity of said solution surface in said replenisher tank.

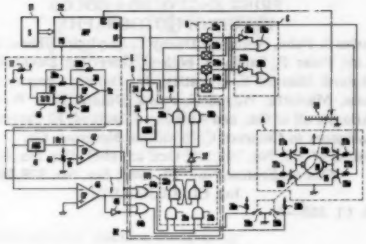
4,705,380

AUTOMATIC FOCUSING DEVICE

Hiroshi Yamamoto, and Akira Akashi, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 719,681, Apr. 4, 1985, abandoned. This application Sep. 19, 1986, Ser. No. 910,342
Claims priority, application Japan, Apr. 4, 1984, 59-67203
Int. Cl.[4] G03B 3/10
U.S. Cl. 354—402 3 Claims





1. An auto-focussing device for a single lens reflex camera, comprising:

a focus lens for forming an image of an object:

a zoom lens for zooming, located on the object side of said focus lens;

in-focus detection computing means for outputting an electrical signal corresponding to the in-focus state obtained by said focus lens and an in-focus state caused by a focal point movement by the zooming action of said zoom lens;

a motor for moving said focus lens;

Power supply control means for controlling power supplied to the motor;

means for detecting an amount of change in the focal length on the basis of comparison between focal length information of a preceding operation and a focal length of an instant operation;

means for detecting the direction of the change on the basis of the comparison; and

first control means for operating said power supply control means by inputting signals from the focal point detection computing means, the focal length change amount detection means and the change direction detecting means; said first control means including;

means for continuously operating said power supply control means for a prescribed time when the infocus state is largely deviated on the basis of the signal from the focal point detection computing means, and

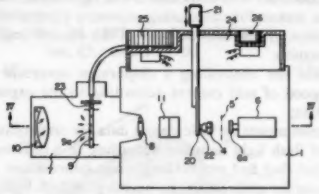
means for determining the rotation direction of said motor on the basis of the signal from the change amount detection means and the change direction detection means.

4,705,381

PHOTOGRAPHING APPARATUS FOR MICROSCOPE

Yasuo Inoue, Hachiouji, and Daizo Shinohara, Fuchu, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1986, Ser. No. 924,036
Claims priority, application Japan, Oct. 30, 1985, 60-241338
Int. Cl.[4] G03B 7/00, 13/02, 17/48
U.S. Cl. 354—411 16 Claims



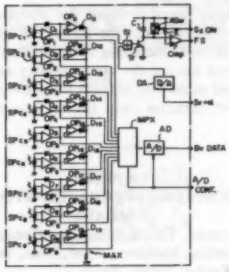
1. A photographing apparatus for microscopes comprising a film set in an image forming position on a first light path of a light from a sample, an indicator arranged in a position substantially conjugate with the surface of said film on a second light path branched from the first light path, a first light source for illuminating said indicator arranged adjacently to said indicator, an output generating means for determining the exposure time in photographing of a sample image formed on said film and a first adjusting means connected to said first light source and output generating means and capable of proportionally adjusting the brightness of said first light source and the output to be issued from said output generating means, the output to be issued from said output generating means being determined so as to make it possible to photograph the sample image with a proper exposure by operating said first adjusting means to make the brightness of said indicator determined by said first light source coincide with the brightness of the sample image formed on said indicator.

4,705,382

FLASH PHOTOGRAPHING APPARATUS

Hiromu Mukai, Kawachinagano; Toshio Yamaki, Osaka; Akihiko Fujino; Shuji Izumi, both of Sakai; Masaaki Nakai, Kawachinagano, and Nobuyuki Taniguchi, Nishinomiya, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 14, 1986, Ser. No. 918,077
Claims priority, application Japan, Oct. 16, 1985, 60-230514; Oct. 17, 1985, 60-232499; Oct. 18, 1985, 60-233835
Int. Cl.[4] G03B 7/097, 7/099, 7/28, 15/05
U.S. Cl. 354—412 12 Claims



1. A flash photographing apparatus including a camera and an electric flash device, comprising:

first light measuring means for measuring a brightness of light incident from a main object in a particular light

receiving region within a camera photographing area and outputting first brightness information in response to this light measurement;

second light measuring means for measuring a brightness of light incident from a sub object in a region within said camera photographing area other than said particular light receiving region and outputting second brightness information in response to this light measurement;

first means for calculating exposure control data for flash photography on the basis of the second brightness information;

means for controlling a diaphragm aprerture and shutter speed of said camera according to the exposure control data;

second means for calculating data for controlling a quantity of flash light emission according to a difference between said first and second brightness information; and,

means for controlling the quantity of flash light emission on the basis of the flash emission controlling data.

4,705,383

DEVELOPING APPARATUS

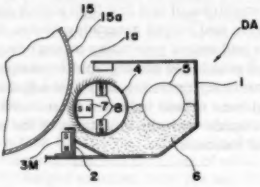
Yuji Hiraga, Nara, and Tatsuya Ito, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 10, 1985, Ser. No. 807,459

Claims priority, application Japan, Dec. 10, 1984, 59-188347[U]; Dec. 10, 1984, 59-188349[U]

Int. Cl.[4] G03G *15/08*

U.S. Cl. 355—3 DD **5 Claims**



1. A developing apparatus comprising:

a magnetic roller having a main pole magnet and interpole magnets provided therein, a first pole of said main pole magnet being directed outwardly with the first pole of each of said interpole magnets being opposite in polarity to the first pole of said main pole magnet, said first poles of said interpole magnets being directed outwardly and attracting a developing material including toner and carrier particles onto the surface of said magnet roller through magnetic induction of said main pole magnet and said interpole magnet; and

a doctor blade for restricting the amount of developing material attracted onto the surface of said magnet roller said doctor blade including a magnet member, with a first pole thereof having the same polarity as that of the first pole of said main pole magnet for preventing adhesion of the carrier particles onto the surface of said magnetic roller.

4,705,384

IMAGE FORMING APPARATUS WITH LOCKING MEANS

Morikazu Mizutani, Tokyo; Shigeyoshi Onoda, Yokohama, and Shinji Kanemitsu, Ichikawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 13, 1985, Ser. No. 797,491

Claims priority, application Japan, Nov. 15, 1984, 59-242156

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—3 R **15 Claims**

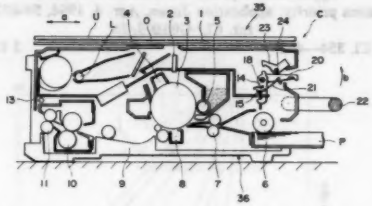
1. An image forming apparatus comprising:

frame means divisible into a plurality of parts;

image forming mean provided in said frame means;

a grip for carrying said apparatus, the grip being movable between a carrying position and a retracted position;

latching means shiftable between a latching position for



preventing said frame means from being divided and a releasing position for allowing the frame means to be divided, wherein when said grip is at the carrying position, said latching means is prevented from shifting from the latching position to the releasing position.

4,705,385

PRINT ENGINE FOR COLOR ELECTROPHOTOGRAPHY

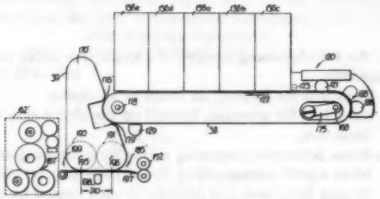
Charles S. Palm, Norcross; Danny L. Slayton, Lilburn; Khosrow Lak; Peter F. Sampson, both of Doraville; David R. Davis, Buford; Maurice S. Wheatley, Jr., Duluth; Gregory A. Chatham, Marietta; Wayne C. Jones, Duluth; Kirk W. Charles, Atlanta, all of Ga., and Anthony J. Ireland, El Cerrito, Calif., assignors to Colorocs Corporation, Norcross, Ga.

Division of Ser. No. 791,218, Oct. 25, 1985, Pat. No. 4,652,115.

This application Nov. 10, 1986, Ser. No. 929,268

Int. Cl.[4] G03G *15/01*

U.S. Cl. 355—4 **1 Claim**



1. A color print engine for use in an electrophotographic system comprising in combination:

a first closed belt carrying said photoreceptor thereon having a characteristic first length, said first belt being driven around a pair of rollers laterally disposed so that said first belt includes an elongated horizontal upper surface;

a second electrostatic transfer closed belt having a characteristic second length, said second length being nominally an integer submultiple of said first length, said second electrostatic transfer closed belt being driven about a plurality of rollers so that a predetermined portion of said second belt contacts said first belt at one of said pair of rollers;

image source means disposed above said first belt and for creating an electrostatic image on said photoreceptor in response to said light;

at least four developer modules for carrying at least four distinct toners disposed above said elongated horizontal upper surface of said first belt, each of said developer modules including a toner exit opening, and all of said toner exit openings being disposed in a common plane

substantially parallel to said elongated horizontal upper surface of said first belt;

a fuser disposed below said elongated horizontal upper surface of said first belt and to one side of the bottommost one of said plurality of rollers carrying said second belt;

a paper tray disposed below said first belt and aligned with said fuser so as to provide a substantially straight horizontal paper path from said paper tray under said bottommost one of said plurality of rollers carrying said second belt, on to said fuser.

4,705,386

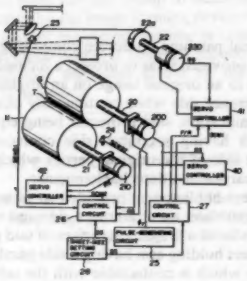
COLOR COPYING MACHINE

Akira Ogita, Sagamihara, and Masaaki Tanaka, Yokohama, both of Japan, assignors to Shinko Electric Co., Ltd. and Fuji Xerox Co., Ltd., both of Tokyo, Japan

Filed May 12, 1986, Ser. No. 862,017

Int. Cl.[4] G03G *15/01*

U.S. Cl. 355—4 **4 Claims**



1. A color copying machine comprising:

(a) scanning means for applying illumination onto a color original to effect a scanning operation;

(b) a photoconductive drum operable to rotate at a constant speed;

(c) means for charging said photoconductive drum uniformly;

(d) color separator means including a plurality of optical filters of different colors, each of said filters allowing a predetermined light component of said illumination to pass therethrough during each scanning operation so as to apply it onto said photoconductive drum to form an electrostatic original image thereon;

(e) developing means for applying color toner to said electrostatic original image to form a developed original image;

(f) a transfer drum rotatable at a variable speed, said transfer drum being adapted to hold a record sheet therearound, said developed original image on said photoconductive drum being transferred to said record sheet;

(g) first sensor means for sensing the initiation of each scanning operation to feed a first sensing signal;

(h) second sensor means for sensing the position of said record sheet on said transfer drum to feed a second sensing signal; and

(i) control means responsive to said first and second sensing signals for detecting start and end timings of the transferring of each of said developed original images onto said record sheet and for controlling said transfer drum to rotate at the same speed as said photoconductive drum during the transfer of each developed original image to said record sheet, said control means controlling said transfer drum to rotate during a time interval between the two consecutive transfer operations at such a speed that a leading edge of said record sheet on said transfer drum is brought into agreement with a leading edge of each developed original image on said photoconductive drum.

4,705,387

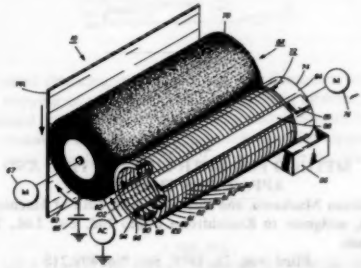
CLEANING APPARATUS FOR CHARGE RETENTIVE SURFACE

Ying-wei Lin, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 21, 1983, Ser. No. 563,729

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—15 **17 Claims**



1. Apparatus for removing charged particles comprising toner particles from a surface with subsequent separation of particles having a predetermined diameter and charge from the rest of the particles, said apparatus comprising:

an endless particle removal member supported adjacent said surface for movement in a first direction such that portions thereof move toward and away from said surface;

electrostatic detoning structure supported adjacent said endless particle removal member for movement relative thereto and for electrostatically attracting toner particles from said endless particle removal member;

means carried by said detoning structure for moving particles having said predetermined diameter and charge in a direction substantially perpendicular to said first direction.

4,705,388

METHOD AND APPARATUS FOR DETERMINING WHEN A LAYER OF TACKY MATERIAL PRESENT ON A CLEANING MEMBER NEEDS TO BE REJUVENATED

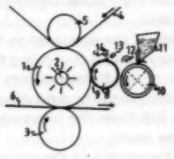
Joseph M. J. E. Huntjens, Asten; Henricus G. J. M. Kockelmans, Tegelen, and Jozef J. A. Pleyers, Baarlo, all of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

Filed May 8, 1986, Ser. No. 861,227

Claims priority, application Netherlands, May 9, 1985, 8501321

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—15 **8 Claims**



7. A device for cleaning a surface that has been put into contact with a softened thermoplastic material, comprising:

(a) a cleaning member contacting the surface to be cleaned

and being covered with a layer of tacky material for removing contaminants from the surface to be cleaned;

(b) a rejuvenator for applying a fresh layer of tacky material onto the cleaning member;

(c) a means for repeatedly measuring light reflected by the layer of tacky material present on the cleaning member;

(d) a means for comparing the measured light reflection with a reference value and emitting a signal as soon as the difference between the measured value and the reference value is in a predetermined range to activate the rejuvenator.

4,705,389

METHOD FOR BOTH-SIDE COPYING AND APPARATUS THEREFORE

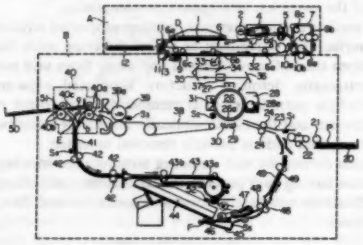
Yoshikazu Maekawa, and Susumu Okui, both of Hachioji, Japan, assignors to Konishiroku Photo Ind. Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1986, Ser. No. 899,215

Claims priority, application Japan, Aug. 26, 1985, 60-185926; Oct. 7, 1985, 60-221867

Int. Cl.[4] G03B *27/32, 27/52*

U.S. Cl. 355—26 **13 Claims**



1. A method of copying images printed on both sides of document using an automatic conveying device capable of reversing the side of said document to be copied, which comprises:

feeding a document and a sheet to respective copying positions by respective conveying devices,

a first side copying step of copying the image of a first side of the document onto the sheet, in which the copied sheet is delivered to a sheet delivery tray during one side copy mode copying the images onto only one side of the sheet or the copied sheet is stored into an intermediate tray during both side copy mode copying the images onto both sides of the sheet,

reversing the side of the document to be copied,

a second side copying step of copying the another images of a second side of the document onto a fresh sheet during the one side copy mode or onto other side of the one side copied sheet fed from the intermediate tray during the both side copy mode,

delivering the document and the copied sheet to respective delivery trays, and

controlling the copying step while judging whether the copying step is the first side copying step or the second side copying step and whether the copy mode is the one side copy mode or the both side copy mode.

4,705,390

ORIGINALS PATCHING DEVICE

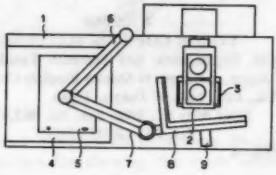
Shuhei Kasahara, Hirakata, and Mochisuke Hiroshima, Kyoto, both of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 596,532, Apr. 4, 1984, abandoned. This application Sep. 17, 1986, Ser. No. 910,288

Claims priority, application Japan, Apr. 25, 1983, 58-72679

Int. Cl.[4] G03B *27/68*

U.S. Cl. 355—52 **3 Claims**



1. An original patching up device comprising:

a projector provided so as to project a focused image corresponding to an original image on an original carrier having a reference side while continuously changing projection magnification, said projector being equipped with a draft rack having a contact side contactable with the reference side of the original carrier which charges said original carrier in a detachable manner;

a layout sheet holding arm provided so as to hold a block copy layout sheet on a reference side and move within a plane parallel to a projection surface of said projector, said layout sheet holding arm having a side parallel to its reference side which is contactable with the reference side of the original carrier when taken out of the draft rack of the projector;

an original holder provided so as to project perpendicularly from another side of said layout sheet holding arm parallel to the reference side, said original holder having means for releasably holding an original after transference of the original from the original carrier; and means for holding a transparent sheet on the same plane as the projection surface of said projector in a specified positional relation to the reference side of said layout sheet holding arm, so that the original on the original carrier is transferred onto the transparent sheet keeping a relative angle between the original and an image on the block copy layout sheet.

4,705,391

METHOD AND DEVICE FOR CONTROLLING AN IMAGE FORMING DEVICE

Hendrikus W. J. Peeters, AK Helden; Hendricus M. J. C. van Kuringen, JC Venlo, and Gerardus M. Hoeymakers, JJ Horst, all of Netherlands, assignors to Oce-Nederland B.V., Venlo, Switzerland

Filed Oct. 9, 1985, Ser. No. 785,838

The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.[4] G03G *13/00;* G03B *27/32*

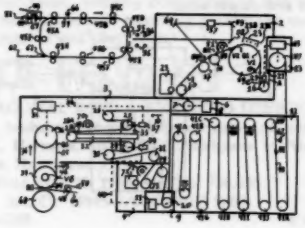
U.S. Cl. 355—77 **2 Claims**

1. A method of controlling an image forming device in which images are formed on an advancing medium wherein the position of an image with respect to an initial position is registered by counting periods of a pulse signal, the frequency of which is proportional to the speed at which the medium is advanced,and wherein the registered positions are repeatedly compared with a number of predetermined positions with control signals being generated if the compared positions are identical, the improvement wherein

(a) a plurality of images can be under formation at one time and both a first position related to the leading edge and a

second position related to the trailing edge are registered for each image under formation;

(b) the predetermined positions are divided into a first and a second group, which groups are related to respectively a leading edge action table and a trailing edge action table;



(c) each first position is compared with the predetermined positions from the first group to determine whether and what action by the image forming device is necessary; and

(d) each second registered position is compared with the predetermined positions from the second group to determine whether and what action by the image forming device is necessary.

4,705,392

VACUUM APPARATUS BLANKET AND METHOD OF MAKING THE SAME

Albert H. Ohlig, 487 Esther St., Costa Mesa, Calif. 92627

Filed Aug. 29, 1986, Ser. No. 901,895
Int. Cl.[4] G03B *27/20*
U.S. Cl. 355—91 **6 Claims**

1. The method of forming a flexible vacuum banket, comprising the steps of:

depositing upon one surface of the sheet in selected portions of the area thereof a plurality of protrusions of a curable fluid material that adheres to the sheet to form therewith a non homogeneous sheet including a selected array of said protrusions, and

curing the fluid material to form flexible protrusions where deposited which are substantially incapable of being compressed into the surface of the sheet for forming fluid channels around the protrusions.

4,705,393

COPYING APPARATUS WITH A DOCUMENT FEEDER

Masazumi Ito, Toyohashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 27, 1985, Ser. No. 813,948
Claims priority, application Japan, Dec. 27, 1984, 59-275687
Int. Cl.[4] G03G *15/00*; B65H *7/02*
U.S. Cl. 355—14 SH **4 Claims**

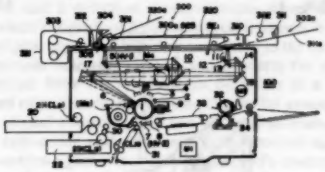
1. In a copying apparatus which includes a photosensitive member, means for forming an electrostatic latent image of a document placed on a transparent support table, means for developing said latent image and means for transferring the developed image onto a paper, the apparatus comprising:

a document feeding means for feeding a document from the support table;

a document retaining means provided downstream of said document feeding means for receiving and retaining the document;

an interruption copying means for interrupting copying of the document on the support table to enable copying of another document;

first control means to activate said document feeding means to feed the document to said document retaining means in response to said interruption copying means, said docu-



ment retaining means retaining the document while the copying of said other document is being effected; and

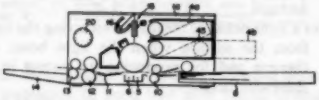
second control means for activating said document retaining means to feed the document back onto the support table upon completion of copying of said other document.

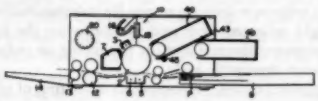
4,705,394

MULTI-COLOR IMAGE FORMING APPARATUS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 3, 1985, Ser. No. 804,145
Claims priority, application Japan, Dec. 4, 1984, 59-256144
Int. Cl.[4] G03G *15/06*
U.S. Cl. 355—3 DD **10 Claims**





8. An image forming apparatus comprising:

(a) a housing;

(b) an image carrier disposed in said housing and adapted to have latent images formed on the surface thereof;

(c) first developing means mounted in said housing so as to be rockable between a firt developing position, in which said first developing means is disposed opposite said image carrier and is adapted to apply a first developing agent to said image carrier to thereby develop a latent image formed on the surface of said image carrier, and a first nondeveloping position; and

(d) second developing means mounted in said housing so as to be linearly movable between a second developing position, in which said second developiog means is disposed opposite said image carrier and adapted to apply a second developing agent to said image carrier to thereby develop a latent image formed on the surface of said image carrier, and a second nondeveloping position, said second developing means moving said first developing means from the first developing position to the first nondeveloping position when said second developing means is moved from the second nondeveloping position to the second developing position.

4,705,395

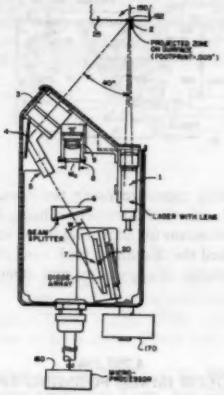
TRIANGULATION DATA INTEGRITY

Omer L. Hageniers, Windsor, Canada, assignor to Diffracto Ltd., Windsor, Canada

Filed Oct. 3, 1984, Ser. No. 657,261

Int. Cl.[4] G01C *3/00*

U.S. Cl. 356—1 **13 Claims**



1. An electro-optical system for determining distance to a surface, said system comprising:

(a) an electro-optical triangulation sensor comprising:

(i) a light source for projecting a light beam onto the surface;

(ii) a light detector means for receiving the light reflected from the surface when the light beam is projected thereon and for producing an output in accordance therewith; and

(iii) means responsive to the output of said light detector for determining the distance to the surface;

(b) a reference detector means for independently sensing the light reflected from said surface when the light beam is projected thereon and for producing an output in accordance therewith; and

(c) control means, responsive to the output of said reference detector means, for controlling an operating characteristic of said triangulation sensor based exclusively on the output of said reference sensor.

4,705,396

IMAGE MONOCHROMATOR

Arne Bergström, Drottninghamnsvagen 72, S-13146 Nacka, Sweden

PCT No. PCT/SE83/00307, § 371 Date May 2, 1984, § 102(e) Date May 2, 1984, PCT Pub. No. WO84/01028, PCT Pub. Date Mar. 15, 1954

PCT Filed Aug. 30, 1983, Ser. No. 610,295

Claims priority, application United Kingdom, Sep. 4, 1982, 8225265

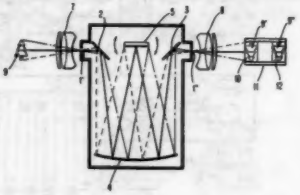
Int. Cl.[4] G01J *3/14, 3/18*

U.S. Cl. 356—332 **11 Claims**

1. An image monochromator comprising: an outer objective optical system with input and output optical imaging components which together form said objective system, said outer objective system being arranged: a) to receive light from an object field to be viewed, and b) to produce a viewable image of said object field on a picture plane;

an inner optical system interposed between said optical imaging components to transmit light between said optical imaging components at a selected tunable narrow wavelength band, whereby said viewable image is produced as a monochromatic image;

said inner system comprising an input slit to receive light from said input optical imaging component, imaging means arranged to project an image of the input slit on an output slit, and tunable dispersive means between said input and output slits;



and said input and output optical imaging components being arranged such that said inner optical system receives at said input slit light rays from each object point which have an angular relationship to each other within a range from slightly divergent to slightly convergent

whereby the said monochromatic image which is produced is of the entire said object field.

4,705,397

LASER PULSE TRAIN JITTER MEASURING DEVICE

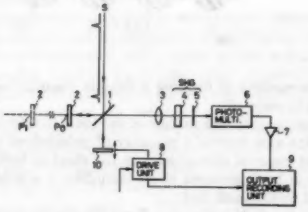
Yutaka Tsuchiya; Shinichirou Aoshima, and Akira Takeshima, all of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Mar. 27, 1986, Ser. No. 844,962

Claims priority, application Japan, Mar. 28, 1985, 60-64094

Int. Cl.[4] G01B *9/02;* G01J *3/45*

U.S. Cl. 356—345 **10 Claims**



1. A laser pulse train jitter measuring device comprising:

a source of a laser beam to be measured for jitter;

a first optical path;

a second optical path;

means for receiving said laser beam from said source and for splitting said laser beam into a first split beam directed to said first optical path and a second split beam directed to said second optical path;

means for setting said first optical path to a first path length or a second path length;

means for varying the length of said second optical path from a first value to a second value;

means for producing a correlated beam by recombining said first split beam and said second split beam after said first split beam has traversed said first optical path and said second split beam has traversed said second optical path;

means for providing the second harmonic of said correlated beam;

means for producing a photo-electric signal corresponding to said second harmonic of said correlated beam; and

recording means for producing a first recording of said photo-electric signal corresponding to said correlated beam produced when said first optical path has said first

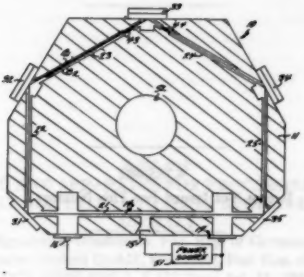
path length while said length of said second optical path is varied from said first value to said second value, and a second recording of said photoelectric signal corresponding to said correlated beam produced when said first optical path has said second path length while said length of said second optical path is varied from said first value to said second value, whereby comparison of said first recording and said second recording enables the measurement of jitter in said laser beam.

4,705,398

PENTAGONAL RING LASER GYRO DESIGN

Wah L. Lim, Anaheim; James P. Hauck, Santa Ana, and Jack W. Raquet, Hermosa, all of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Filed May 20, 1985, Ser. No. 736,035
Int. Cl.[4] H01S *3/083;* G01B *9/02*
U.S. Cl. 356—350 **6 Claims**



1. A ring laser gyroscope conformed as a closed resonator cavity into which oppositely directed laser beams are inserted, comprising:

said resonator cavity including an elongate base segment communicating with substantially orthogonal elongate lateral segments at the ends thereof, each said lateral segment communicating further with inclined elongate segments joined to each other to form an apex, to define a pentagonal cavity,

a first electrode disposed at the middle of the base segment for carrying a first voltage, and

opposing second electrodes disposed proximate the ends of the base segment for carrying second voltages, wherein the base segment and electrodes form a split discharge tube for producing said oppositely directed laser beams.

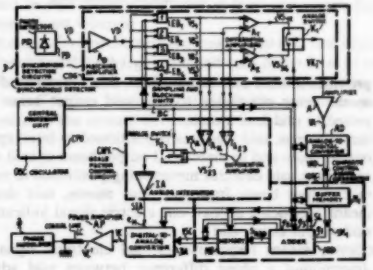
4,705,399

DEVICE FOR MEASURING A NONRECIPROCAL PHASE SHIFT PRODUCED IN A CLOSED-LOOP INTERFEROMETER

Philippe Graindorge, Magny les Hameaux; Hervé Arditty, Marly Le Roi, and Hervé Lefevre, Paris, all of France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 743,674, Jun. 11, 1985, abandoned. This application Mar. 3, 1987, Ser. No. 21,574
Claims priority, application France, Jun. 14, 1984, 84 09311
Int. Cl.[4] G01B *9/02;* G01C *19/64*
U.S. Cl. 356—350 **5 Claims**

1. An interferometric device for measuring a nonreciprocal phase shift experienced by two light waves circulating in opposite directions within a closed-loop waveguide, said device comprising a monochromatic light source, photodetecting means for detecting the interference of said two waves and delivering an output electric signal which is representative of the light intensity of the detected interference and optical beam-splitting and mixing means for optically coupling the ends of said waveguide to said light source and to said photodetecting means, electrically controlled optical phase-shifting means placed within the closed loop which produces action on said waves, an oscillator for delivering periodic electric signals in the form of square-wave pulses having a frequency $f_o = \frac{1}{2}\ t_o$, where t_o is the time taken by each wave to travel along the optical path defined by the closed loop, synchronous detection circuits for receiving the output signal of the photodetector on a first input and a detection synchronization signal derived from said electric signals of frequency f_o on a second input, an analog-to-digital converter which is connected to the output of the synchronous detection circuits and converts the electric signals derived from the synchronous detection to a signed binary word of predetermined length, circuits for generating a composite digital control signal and a digital-to-analog converter for converting said composite digital control signal to an analog control signal which is transmitted to a control input of said optical phase-shift means, and means for control and synchronization of the synchronous detection circuits, of the analog-to-digital converter, of the circuits for generating the composite digital control signal and of the digital-to-analog converter, the function of said circuits for generating said composite digital control signal being to produce a signal



derived from the superposition of a first square-wave periodic signal at said frequency f_o, such that after digital-to-analog conversion, said first signal imparts a periodic reciprocal-effect phase shift alternately of $+\pi/2$ and $-\pi/2$ radians to said two waves which circulate in opposite directions in the closed loop, and of a second signal in stair-steps in which each stair-step has a duration equal to said time interval t_o or to an odd integral multiple of said time interval and an amplitude such that, after analog-to-digital conversion, said second signal imparts additional reciprocal-effect incremental phase shifts having an amplitude proportional to the amplitude of said non-reciprocal phase shift and of opposite sign, the phase shift imparted by the second signal being such as to produce a relaxation having an amplitude of 2π radians, thereby ensuring that said superposition of the first and second signals forming the composite control signal imparts to the waves circulating in opposite directions within the closed loop total phase shifts between said two waves which vary alternately between $-\pi/2$ and $+\pi/2$ radians during the first periods and $-3\pi/2$ and $+3\pi/2$ radians during the second periods, said first and second periods being such as to occur successively in an overlapping sequence.

4,705,400

SHEARING PHASE DIFFERENCE SENSOR

Brent L. Ellerbroek, Los Angeles, and Brian D. Cohn, El Segundo, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

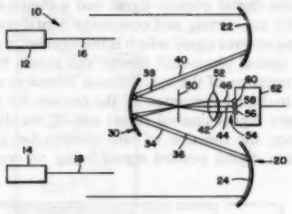
Filed Dec. 9, 1985, Ser. No. 806,893
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—353 **19 Claims**

1. A shearing phase difference sensor for a high energy laser source which generates mutually adjacent light coherent beams comprising:

optical modifying means having a transmittance which varies mathematically in a periodic fashion and as a square of a trigonometric function of displacement along a surface transverse to a direction of rays of light propagating via said modifying means,

means for extracting a sample from each adjacent coherent beam, said extracting means being positioned such that said extracted sample is directed to said optical modifying means,

lens means, said optical modifying means diffracting said sample beams to produce a diffraction pattern which



provides at least one output beam, said optical modifying means being positioned so that said output beam is directed to said lens means,

detector means, said lens means positioned to intercept said output beam and to direct said output beam to said detector means, said detector means being positioned to receive said output beam from said lens means, said detector means producing at least one electric signal indicative of said output beam, and

processor means responsive to said electrical signals for determining a phase difference between said adjacent coherent sample beams.

4,705,401

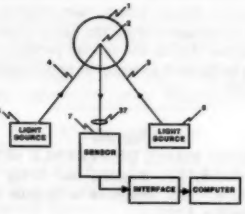
RAPID THREE-DIMENSIONAL SURFACE DIGITIZER

David A. Addleman, Pacific Grove, and Lloyd A. Addleman, Big Sur, both of Calif., assignors to Cyberware Laboratory Inc., Pacific Grove, Calif.

Filed Aug. 12, 1985, Ser. No. 764,302

Int. Cl.[4] G01B *11/24*

U.S. Cl. 356—376 **5 Claims**



1. An apparatus for performing high speed noncontacting mensuration of 3-dimensional surfaces comprising:

a means for illuminating said surface with one or more planes of light intersecting said surface and producing contour lines;

a means for moving said surface relative to said planes of light;

a means for sensing points on said contour lines reflected from said surface;

a means for accurately determining the position of said points over a wide dynamic range of reflected light intensity and beam spreading, whereby a wide variety of surfaces can be measured without adjusting sensor sensitivity or lens aperture; said means including a circuit wherein the sensor output is divided into two parts, the first being delayed before connection to one input of an amplitude comparator, the second connected to the remaining input of the comparator resulting in an amplitude and distortion insensitive timing detector;

a means for storing the point position data;

a means to provide synchronization for all parts of the apparatus.

4,705,402

Patent Not Issued For This Number

4,705,403

APPARATUS AND METHOD FOR MEASURING A PHOTOMETRIC CHARACTERISTIC OF A SAMPLE PORTION

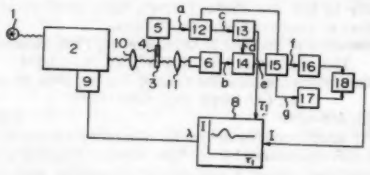
Ken Eguchi, Yokohama; Yukuo Nishimura, Sagamihara; Masahiro Haruta, Funabashi; Hiroshi Matsuda, Yokohama; Yutaka Hirai, and Takashi Nakagiri, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 712,026

Claims priority, application Japan, Mar. 21, 1984, 59-53979; Mar. 21, 1984, 59-53980; Mar. 21, 1984, 59-53981; Mar. 21, 1984, 59-53982; Mar. 21, 1984, 59-53983

Int. Cl.[4] G01J *3/42*; G01N *21/27*

U.S. Cl. 356—319 **9 Claims**



1. A photometric apparatus comprising:

a light source for irradiating a sample with a light beam;

means for oscillating a beam spot of the light beam on the sample relative to the sample, said oscillating means being driven according to an oscillation control signal;

means for generating sampling trigger pulses in synchronization with the oscillation control signal;

means for generating sampling pulses, the generation of each of said sampling pulses being delayed for a predetermined delay time after the generation of each of said sampling trigger pulses;

means for measuring light from the sample; and

means for extracting, in accordance with the sampling pulses, a photometric characteristic of a portion of the sample obtained by said measuring means.

4,705,404

METHOD AND APPARATUS FOR PROCESSING MIXED ASPHALT MATERIAL UTILIZING BROKEN-UP USED ASPHALT

Horst Brüggemann, Glashütten, Fed. Rep. of Germany, assignor to Deutsche Asphalt GmbH, Frankfurt, Fed. Rep. of Germany

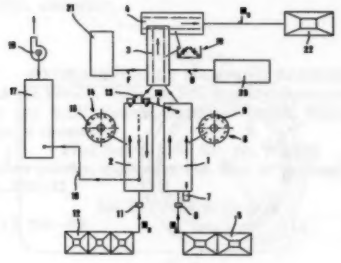
PCT No. PCT/DE85/00433, § 371 Date Jul. 11, 1986, § 102(e) Date Jul. 11, 1986, PCT Pub. No. WO86/02962, PCT Pub. Date May 22, 1986

PCT Filed Oct. 31, 1985, Ser. No. 887,092

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1984, 3441382

Int. Cl.[4] B28C *5/08, 5/46*

U.S. Cl. 366—7 **24 Claims**



1. In a method for processing mixed asphalt material utilizing broken-up used asphalt and new material utilizing a plurality of burner-heated drums, comprising heating used asphalt in a parallel-flow drum mixer under conditions substantially avoiding damage to the used asphalt, and heating the new material to a temperature higher than the temperature of the asphalt in a counter-flow drying drum, mixing the used asphalt and the new material in a connected mixer while adding bitumen and filler to obtain an asphalt mixture, the improvement comprising

introducing exhaust gases comprising CH_x and CO from the parallel-flow drum mixer directly into the drying drum;

heating the gases to a temperature sufficient to allow the combustion or decomposition of CH_x and CO in the drying drum; and

allowing for the heating gases to further heat the new material in the drying drum to a temperature higher than that of the used asphalt.

13. In an apparatus for processing asphalt material utilizing broken-up used asphalt and adding new material, comprising

first and second parallel drum devices, wherein said first device is a parallel-flow mixer for processing the used asphalt, and said second device is a counter-current drying drum for processing the new material; said first and second devices having material discharge points and said second device having a frontal face provided with apertures and a burner;

at least one mixer;

means for transferring exhaust gas containing CH_x and CO connected said first and said second devices;

means connecting the material discharge points of said first and second devices with said at least one mixer; the improvement wherein

said means for transferring is connected to said first device at the material discharge point and ends in the form of a feed channel in the frontal face of the second device, said channel being connected through the apertures to the inside of the second device.

4,705,405

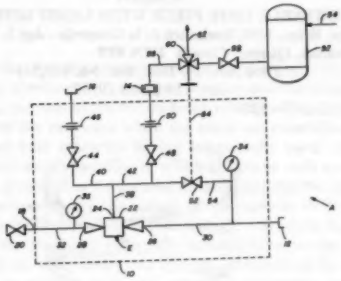
MIXING APPARATUS

Leslie P. Williams, Port Neches, Tex., assignor to CCA, Inc., Port Neches, Tex.

Filed Apr. 9, 1986, Ser. No. 849,690

Int. Cl.[4] B01F *15/02*

U.S. Cl. 366—160 **17 Claims**



1. An apparatus for mixing chemicals comprising:

a motive fluid inlet;

a first chemical inlet

a second chemical inlet;

a chemical outlet;

eductor means having a chemical inlet port theron for inducing flow of a chemical from said first chemical inlet and another chemical from said second chemical inlet into said chemical inlet port, said eductor means having an inlet in

flow communication with said motive fluid inlet and an outlet in flow communication with said chemical outlet;

restriction means with said first and second chemical inlets for regulation of chemical flow through said first and second chemical inlets;

a purge conduit extending from said motive fluid inlet to at least one of said first chemical inlet and said second chemical inlet;

a purge valve in said purge conduit; and

whereupon chemical flow from said first and second chemical inlets passes from said chemical inlet port of said eductor means to its outlet and out of the apparatus through said chemical outlet.

4,705,406

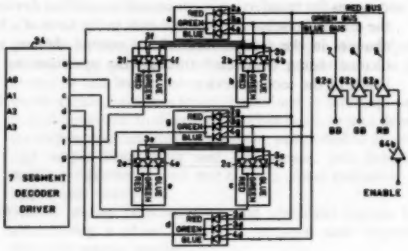
ELECTRONIC TIMEPIECE WITH PHYSICAL TRANSDUCER

Karel Havel, P.O. Box 66, Station M, Toronto, Ontario, Canada M6S 4T2

Division of Ser. No. 817,114, Jan. 8, 1986, Pat. No. 4,647,217. This application Nov. 3, 1986, Ser. No. 926,511

Int. Cl.[4] G04B *47/00*

U.S. Cl. 368—10 **11 Claims**



1. The method of simultaneously indicating values of time and values of a physical quantity, on a single variable color digital display means, by cuasing a digital indication of time to be exhibited on said display means and by controlling the color of said digital indication in accordance with the values of said physical quantity.

4,705,407

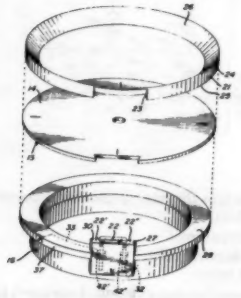
PORTABLE TIME PIECE WITH LIGHT DIFFUSER

André Brien, 1390, boulevard de la Concorde - Apt 2, Laval-des-Rapides, Quebec, Canada H7N 5P5

Filed Nov. 14, 1986, Ser. No. 930,541

Int. Cl.[4] G04B *19/30*

U.S. Cl. 368—227 **12 Claims**



1. A portable time piece having a casing for supporting a watch movement therein, a dial face having time indicating means located in said housing and disposed for visual access from a top side of said housing to display time, said time piece being characterized by a light diffusing ring member disposed along the circumferential edge of said dial face, at least one light source associated with said light diffusing ring member so that light is transmitted along and out of said ring member to illuminate at least a portion of said dial face, said light diffusing ring member being of substantially triangular cross-section and having two right angle walls and an intermediate wall constituting said sloped wall, said sloped wall facing inwardly and angulated outwards of said dial face to direct light rays outwards of said dial face while illuminating said dial face, and electrical circuit means to apply electrical power to said light source, said ring member being provided with a light receiving cavity, means to support said light source in said cavity, said electrical circuit means having a switch element for connecting and disconnecting said power to said light source, said means to support said light source being a light support block in tight sliding fit with an existing element of said time piece, said support block having electrical contacts connected to terminals of said light source and engageable with battery contacts associated with said existing element when said support block is disposed in sliding fit therewith.

4,705,408

WATCH MOUNTED ON A CLIP

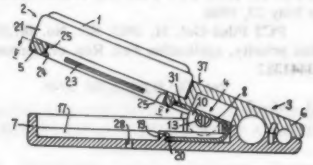
Urs M. Jordi, Crans-pres-Céligny, Switzerland, assignor to Altop S.A., Geneva, Switzerland

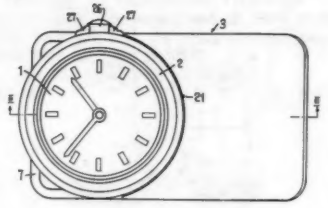
Filed Mar. 16, 1987, Ser. No. 26,180

Claims priority, application European Pat. Off., Apr. 1, 1986, 86810155

Int. Cl.[4] G04B *37/00*; A47F *7/00*

U.S. Cl. 368—278 **2 Claims**





1. In combination, a clip formed of two arms connected by a hinge means, and a watch having a generally circular case mounted on one of said arms so as to be rotatable and removable, wherein the circumference of the case of said watch is provided with ribs and wherein the upper arm of said clip includes an opening for receiving said watch, such opening being provided with shoulders for retaining said ribs and being disposed, relative to the hinge of said clip, on the end which is pressed to open same, each of said arms having a portion thereof adapted for gripping in opposing relation to the other arm, each of said gripping portions being provided with a

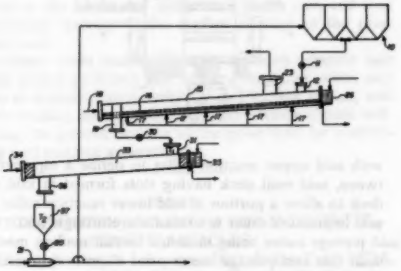
transverse concavity that is generally semi-circular in cross section, additionally including a blocking bar with an extended figure of eight cross-section which can be inserted into said transverse concavities provided in the gripping portion of the clip, the bar being provided, in its central portion with a loop which is orientated towards one side with a transverse opening for receiving a small chain.

4,705,409

METHOD AND APPARATUS FOR MEASUREMENT OF CARBON CONTENT IN FLY ASH

Douglas N. Trerice, 661 Surfside Dr., Pittsburgh, Pa. 15239

Division of Ser. No. 714,529, Mar. 21, 1985, Pat. No. 4,663,507.
This application Sep. 5, 1986, Ser. No. 903,660
Int. Cl.[4] G01N *25/00*
U.S. Cl. 374—45 **4 Claims**



3. An apparatus for measuring carbon content in fly ash comprising,

an absorption chamber having an inlet conduit and an outlet conduit, said inlet conduit having a flow control valve and temperature monitoring means operatively associated therewith,

microwave generating means for introducing microwave energy into said absorption chamber, and

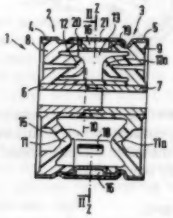
an equilibrium chamber operatively associated with said outlet conduit, said equilibrium chamber having temperature monitoring means for measuring the temperature after absorption.

4,705,410

HYDRAULICALLY DAMPING BEARING

Ulrich von Broock, Weissach, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 2, 1986, Ser. No. 902,699
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1985, 3531182
Int. Cl.[4] F16F *9/10, 1/38*
U.S. Cl. 384—99 **10 Claims**



1. A hydraulically damping bearing comprising:

outer bushing means;

inner bushing means concentrically interior the outer bushing means;

elastic means between said outer and inner bushing means;

two sealed chamber means within said elastic means and filled with a damping medium;

a sealed throttling channel means adjacent said outer bushing means and terminating in said two chamber means for hydraulically connecting said two chamber means;

the bearing consisting of two axial bearing halves axially inserted one within the other;

said elastic means including elastic bellow halves connected with the outer and inner bushing means and having mutually opposite annular beads projecting into the interior of the chamber means;

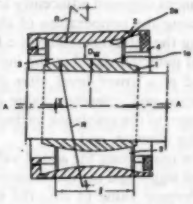
said throttling channel means including an enclosed overflow channel between said elastic bellow halves.

4,705,411

RADIAL ROLLING BEARING

Magnus Kellstrom, Partille, Sweden, assignor to Aktiebolaget SKF, Gothenburg, Sweden

Continuation-in-part of Ser. No. 780,428, Sep. 26, 1985, abandoned. This application Dec. 11, 1986, Ser. No. 940,584
Claims priority, application Sweden, Sep. 26, 1984, 8404813
Int. Cl.[4] F16C *33/36, 33/58*
U.S. Cl. 384—450 **5 Claims**



1. A roller bearing comprising an inner and outer raceway and a row of rollers (3, 7) arranged between and contacting the raceways, the axes of the rollers being substantially parallel to the axes of the raceways when the latter are coinciding, the rollers and both raceways having substantially equal curved longitudinal section profiles in which the curve radii are substantially greater than the greatest distance between the central axis of the bearing and the surface of the raceway of the ring whose center of curvature is closest to the axis of the bearing and wherein the rollers are axially movable between the raceways without being obstructed by axial limitations at the raceways or by limited axial cage play for permitting relative inclination and axial displaceability of the raceways being limited only by the rollers being squeezed radially between the raceways, said radius of curvature of the raceways are being defined by

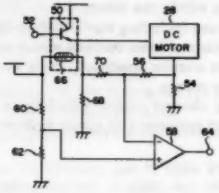
$$k\sqrt{\frac{r_m L_e^2}{D_w \cdot \gamma}}\ .$$

4,705,412

PROTECTION CIRCUIT FOR DRIVE TRANSISTOR OF PRINTER HEAD

Hisayoshi Matsumoto, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 562,410, Dec. 16, 1983, abandoned.
This application Jan. 21, 1986, Ser. No. 820,702
Claims priority, application Japan, Dec. 17, 1982, 57-221390
Int. Cl.[4] B41J *27/26, 3/20*
U.S. Cl. 400—54 **3 Claims**



1. A protection circuit for a shuttle type dot line printer comprising:

a shuttle drive motor for reciprocally driving a shuttle along a perpendicularly crossing direction with respect to the feeding direction of the printing paper;

a motor drive transistor for controlling the electric currents supplied to said shuttle drive motor;

a plurality of impacting styluses arranged in said shuttle so as to form requested character images on the printing paper;

a reference value setting means which outputs reference signal corresponding to a regulated value for the motor drive current;

a motor drive current detecting means which outputs detected signal of motor drive current;

reference value controlling means including a temperature detecting element disposed adjacently to the drive transistor for detecting the temperature of the drive transistor and for setting the reference value at a high level relative to the current detected signal at the initial stage of motor operation and at a lower level after the initial stage of motor operation said reference value controlling means being responsive to the resistance variation of said temperature detecting element; and

a comparator for comparing the added value of said temperature detected signal and the drive current detected signal with said reference value to stop the drive motor when said added value exceeds the reference value;

whereby the drive current for the motor is controlled to be under the regulated value to protect the drive transistor and styluses, and the initial driving performance can be improved by an increase of the regulated value in the initial stage of motor driving.

4,705,413

THICKNESS COMPENSATING MEANS FOR MAILING MACHINE

Walter E. Arnoldi, deceased, late of Southbury, and Walter E. Arnoldi, administrator, West Hartford, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 18, 1986, Ser. No. 886,600
Int. Cl.[4] B41F *13/20;* **B41J** *11/20*
U.S. Cl. 400—56 **2 Claims**

1. An improved mailing machine having a mail deck and having a postage meter detachably mounted thereto such that a portion of said postage meter extends in a cantilevered fashion over a portion of said mailing machine's mail deck, wherein the improvement comprises:

a elongated bracket pivotally mounted at one end to the underside of said mail deck;

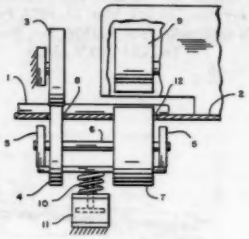
a shaft rotatably mounted at the other end of said bracket;

a impression roller mounted centrally around a portion of said shaft in fixed axial location;

a lower reaction roller mounted centrally around another portion of said shaft in axially spaced apart relationship to said impression roller and in fixed axial location;

a upper reaction roller rotatably mounted to said mailing machine independently of said lower reaction roller and opposite to said lower reaction roller in a fixed vertical position;

means for biasing said bracket such that said lower reaction roller is in generally horizontal tangential communication



with said upper reaction roller to define a nip therebetween, said mail deck having slots formed in said mail deck to allow a portion of said lower reaction roller and said impression roller to extend therethrough; and,

said postage meter being mounted to said mailing machine such that said postage meter print drum is opposite said impression roller,

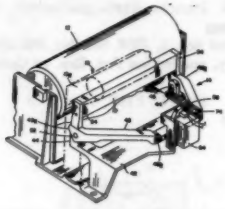
whereby an envelope traversing the mail deck first encounters said nip between said upper and lower reaction rollers causing said bracket to pivotally displace said impression roller relative to the thickness of said envelope prior to said envelope encountering said print drum.

4,705,414

PRINTHEAD MOUNTING AND MOVEMENT CONTROL ASSEMBLY

Jon S. Guy, Garden Grove; Dean-Yuan Liu, Canoga Park, and Albert A. Sholtis, Long Beach, all of Calif., assignors to Sanders Associates, Inc., Nashua, N.H.

Continuation of Ser. No. 765,076, Aug. 13, 1985, abandoned.
This application Jan. 28, 1987, Ser. No. 9,659
Int. Cl.[4] B41J *3/20*
U.S. Cl. 400—120 **1 Claim**



1. A print head mounting and movement control assembly for thermal printing apparatus which prints on a printing medium positioned on a movable platen located adjacent to the assembly, said assembly comprising:

A. a support;

B. a thermal print head;

C. means for pivotally mounting the head to the support for movement between a first position wherein the head is positioned close to the platen for printing and a second

position wherein the head is spaced from the platen to enable the platen to receive and discharge printing medium;

D. an elliptical cam having a rotary axis and a peripheral cam surface with camming segments centered on the major and minor axes of said cam;

E. means for mouting the cam to the support for multiple-revolution rotation about said axis so that said cam surface engages said mounting means;

F. means for biasing said head to one of its said positions;

G. motive means for rotating said cam about its said axis in response to command signals, said cam surface being shaped to maintain said head in its said first position except when one of said camming segments engages said mounting means whereupon said head is moved to its second position;

H. code means having alternating light and dark sectors positioned on a surface of the cam that is perpendicular to said rotary axis, the boundaries of said sectors being located at the major and minor axes of the cam and thus correlated directly to the present position of the print head; and

I. stationary code reading means positioned opposite said code means to detect said sector boundaries when said cam is rotated continuously by said motive means, said code reading means producing head position signals indicating the present position of the print head for controlling said printing apparatus.

4,705,415

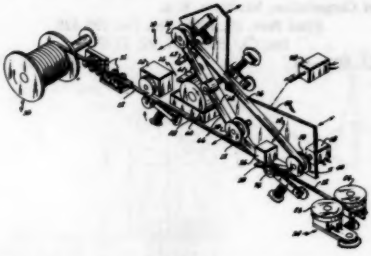
MATRIX PRINTER AND INKER FOR INDEFINITE LENGTH ARTICLES

Andrei Grombchevsky, 24 Lancewood Way, Irvine, Calif. 92715, and Aron Kerner, 17251 Palisades Cir., Pacific Palisades, Calif. 90272

Continuation-in-part of Ser. No. 700,823, Feb. 11, 1985, abandoned. This application Jan. 13, 1986, Ser. No. 818,206

Int. Cl.[4] B41F *17/10;* **B41J** *3/20, 31/14, 35/04*

U.S. Cl. 400—124 **4 Claims**



1. A printer for printing both variable and repetitive information on a moving surface as such surface passes by a printing station, said printer comprising:

stationary dot matrix impact printing means for imprinting markings on a face of a moving substrate at a printing station;

substrate transport means for transporting said substrate past said printing staton in a first direction at a controlled rate;

web transport means for transporting a continuous loop of web element in said first direction at a constant rate past said printing station between said face and said printing means including a plurality of roller means having support surfaces for said web element and means for simultaneously reciprocally moving said plurality of roller means laterally of said first direction relative to said stationary printing means without interrupting transport movement of said web element; and

detachable inking means for applying a marking media to a first surface of said web element, said first surface being disposed in position to contact said face responsive to the action of said printing means whereby said marking media is transferred from said web element to said face at said printing station; and

control means for permitting continuous variation in said markings without interrupting said operation.

4,705,416

POSITIONING DEVICE FOR POSITIONING TYPE-WHEEL INDEX MOTOR IN A PRINTER

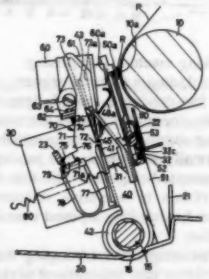
Hideo Asakura, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 24, 1986, Ser. No. 832,232

Claims priority, application Japan, Feb. 27, 1985, 60-27575[U]; Mar. 8, 1985, 60-33816[U]

Int. Cl.[4] B41J *1/30*

U.S. Cl. 400—144.2 **12 Claims**



1. A positioning device for positioning an index motor for a type wheel selectively in an operative and an inoperative position in a printer, the index motor having a drive shaft which is removably engageable with the type wheel, when the index motor is moved to the operative position, to rotate the type wheel for selecting each of multiple type fonts provided on the type wheel, the drive shaft being disengageable from the type wheel when the index motor is moved to the inoperative position, the printer further including: a platen; a carriage movable along the platen, the movement of the carriage defining a carriage movement path; a motor holder provided on the carriage to support the index motor in the operative and inoperative positions, the motor holder being movable between a first and a second position corresponding to the operative and inoperative positions, respectively, the movement of the motor holder defining a motor holder movement path; and biasing means for biasing the motor holder toward its second position, said positioning device comprising:

a stopper fixedly provided on said carriage;

a pivotal support fixedly provided on said motor holder; and

an operating lever comprising as integral parts thereof (a) a base portion, (b) a pivot portion which is adjacent to said base portion, and at which the operating lever is supported by said pivotal support, (c) an operating portion which extends from said base portion, and at which the operating lever is manipulated by an operator of the printer, (d) a first abutment portion engageable with said stopper to hold said motor holder in said first position against a biasing force of said biasing means, (e) a second abutment portion engageable with said stopper to hold said motor holder in said second position against said biasing force of said biasing means, and (f) a first spring portion for biasing the operating lever in a direction that causes said first and second abutment positions to engage said stopper.

4,705,417

POSTAL FRANKING MACHINE

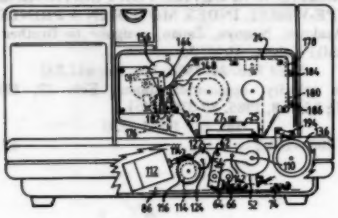
Alan Harry, Royston, England, assignor to PA Consulting Services Limited, London, England

Filed Jan. 14, 1986, Ser. No. 818,666

Claims priority, application United Kingdom, Jan. 19, 1985, 8501405

Int. Cl.[4] B41J *33/24, 35/36*

U.S. Cl. 400—235 8 Claims



1. A postal franking machine comprising:

a work station including a thermal printer;

driving means for driving a postal item to be postally franked past the thermal printer in the work station;

a cassette having supply and take-up spools and a ribbon bearing a thermally activatable dye passing between said spools, said cassette being insertable into the machine to position the ribbon in operative relationship with the thermal printer for franking a postal item driven through the work station;

feed means for pressing on and bringing the driven postal item and the ribbon into engagement at the work station, whereby adhesion created between the postal item and the ribbon by the pressure of the feed means is used to transport the ribbon from the supply spool to the take-up spool;

a detector for sensing the linear movement of the ribbon, the cassette also being operatively positioned relative to said detector on insertion into the machine; and

means responsive to the output of the detector for controlling the timing of print signals supplied to the thermal printer to cause operation of said printer in correctly timed relationship to passage of the driven postal item in order to print franking information.

4,705,418

APPLICATOR DEVICE FOR PRECISION PAINTWORK

Cornelis M. van Wesenbeeck, 4, Kapelstraat, NL-4726 AM Heerle (Province of Brabant), Netherlands

Filed Nov. 18, 1985, Ser. No. 799,161

Claims priority, application Netherlands, Nov. 6, 1985, 8501971

Int. Cl.[4] A46B *11/00, 17/00*

U.S. Cl. 401—15 6 Claims

1. An applicator for applying painted border lines and precisely limited lines and decorations upon surfaces and objects, comprising

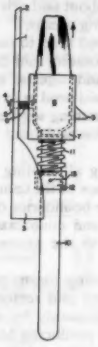
a brush implement having a stem portion and a brush portion mounted on the stem portion and including a multitude of bristles;

a flat mask platform having a sloping edge and an arched fixation end;

a confining sleeve which is displaceable on said brush portion of said implement between a rest position and a plurality of working positions and tightly embraces at least a section of said brush portion to keep said bristles thereof together while received in said sleeve and to expose another section of said brush portion, the magnitude of said exposed section depending on the extent of displacement of said sleeve out of said rest position, for use in applying paint, said sleeve including a push button for displacing said sleeve out of said rest position thereof;

means for resiliently urging said sleeve toward said rest position thereof relative to said brush implement; and

means for mounting said mask platform on said sleeve for joint displacement therewith through an intermediary



position in which said exposed section of said brush portion is substantially flush with said sloping edge of said platform to a fully extended position in which said exposed section extends beyond said sloping edge, and also for resilient movement with respect to said sleeve in a manner bringing said exposed section and said sloping edge closer together and farther apart.

4,705,419

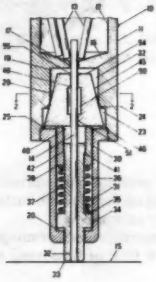
MECHANICAL PENCIL WITH AUTOMATIC LEAD ADVANCE

Robert Niemeyer, Martinez, Calif., assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed Nov. 19, 1985, Ser. No. 799,426

Int. Cl.[4] B43K *21/22, 21/20*

U.S. Cl. 401—65 21 Claims



1. A mechanical pencil having automatic advancement of lead segments comprising:

(a) a housing having a containment chamber for reserve lead segments, an opening at the bottom of the chamber through which a lead sigment may pass end first, and a main internal cavity below and in communication with the opening in the reserve lead containment chamber;

(b) a friction tube mounted within the internal cavity for axial motion therein and having an internal bore adapted to have a lead segment inserted therein in frictional engagement with the walls of the bore, the axis of the bore

of the tube aligning with the opening at the bottom of the containment chamber to define the central axis of the pencil, the friction tube terminating in a lower tip adapted to contact a writing surface;

(c) a collet having plural portions and first and second distinct axially spaced clamping surfaces on the portions positioned beneath the opening from the containment chamber and adapted to selectively engage lead segments passed through he opening, the collet portions having outer camming surfaces oriented obliquely to the axis of the pencil and being movable axially within the internal cavity;

(d) abutment means on the walls of the internal cavity of the housing for engaging the camming surfaces on the collet portions at an axial position between the axially spaced clamping surfaces when the collet portions move axially upwardly within the internal cavity to drive the collet portions inwardly to cause the clamping surfaces thereof to engage a lead segment therebetween; and

(e) means engaged between the friction tube and collet for urging the collet portions axially upward to bring the camming surfaces thereon into engagement with the abutment means when the tip of the friction tube is in contact with the writing surface and is pushed upwardly thereby, whereby a lead segment within the collet is engaged and held by the clamping surfaces.

4,705,420

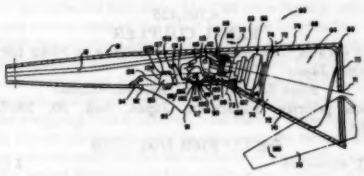
CLEANING SYSTEM HAVING CLEANING FLUID CAPSULE

David J. Bokmiller, and Samuel C. Heck, both of San Antonio, Tex., assignors to Sani-Fresh International, Inc., San Antonio, Tex.

Division of Ser. No. 652,869, Sep. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 592,945, Mar. 23, 1984, Pat. No. 4,640,638. This application Mar. 21, 1986, Ser. No. 843,187

Int. Cl.[4] A46B *11/02;* **A47L** *13/22, 13/17*

U.S. Cl. 401—145 **1 Claim**



1. A cleaning system comprising:

(a) a housing;

(b) a cleaning element connected to one end of the housing;

(c) a cavity in the housing for receiving a cleaning fluid cartridge, the cartridge having a nozzle, a storage chamber and a pump chamber intermediate the nozzle and the storage chamber;

(d) a fluid passageway for conducting cleaning fluid from the cartridge nozzle to the proximity of the cleaning element;

(e) flexible wall means in the cavity for supporting one end of the pump chamber; and

(f) pump actuation means, including a manually operated trigger, for displacing the other end of the pump chamber so as to apply a compressive force to the pump chamber thereby expelling cleaning fluid from the cartridge nozzle, the wall means flexing in response to the compressive force and then returning to the unflexed position whereby cleaning fluid is expelled from the cartridge nozzle after the pump actuation means has reached it maximum displacement.

4,705,421

COUPLING BETWEEN A SHAFT AND A HUB

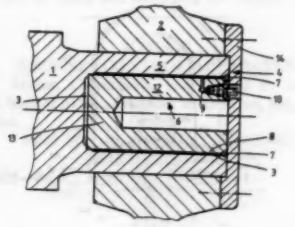
Herbert Depping, Schwagestr. 81, 7928 Giengen, Fed. Rep. of Germany

Filed Nov. 26, 1986, Ser. No. 935,037

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1985, 3543672

Int. Cl.[4] F16D *9/00*

U.S. Cl. 403—2 **13 Claims**



1. A coupling forming a disengageable connection between a shaft and a hub, said coupling operable to transmit power between said shaft and said hub and comprising:

said shaft including a rotary axis and defining a first end with an end face and a borehole at said end face having a borehole bottom, which borehole is coaxial with said rotary axis;

said hub defines a seat, which hub is mounted at said seat on said shaft;

an expandable clamping element coaxially inserted in said borehole, which clamping element has a front end, an inner part and an outer part, which inner and outer parts cooperate to define a chamber therebetween, which chamber receives a pressure medium to provide a pressure lock through surface pressure radially and internally applied to said hub seat;

said inner part defining a passage communicating between said chamber and atmosphere;

a closing device for applying the pressure medium, which closing device is mounted at said clamping element front end facing said shaft front end to close said passage, said closing device including a plug removable to relieve the pressure in said chamber; and,

a device for moving said plug to relieve said pressure, which device is attached to said hub and movable by relative rotation between said shaft and said hub.

4,705,422

MULTI-POSITION FIXTURE

Gary Tsui, Rosemead, and Thomas Heimbigner, Bellflower, both of Calif., assignors to CBC Industries, Inc., City of Commerce, Calif.

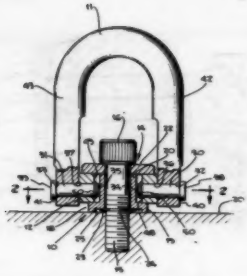
Filed Aug. 8, 1986, Ser. No. 894,632

Int. Cl.[4] F16B *7/06*

U.S. Cl. 403—60 **4 Claims**

1. A multi-position fixture for attachment to a load comprising a load-engaging anchor means including a threaded stud, a retention means having a swivel engagement with the anchor means and adapted to rotate throughout substantially a full circle, a substantially arcuate lifting loop and a transversely disposed pivot structure having opposite shoulder pin elements respectively joined to said loop in a fixed spaced axial relationship with respect to each other, each said shoulder pin element having a captive end at a junction with the loop and a free end, said retention means comprising an annular ring member having opposite parallel faces and inside and outside walls and retention members adjacent opposite faces of said ring member, said ring member having bearing pockets on respective diametrically opposite sides extending between said walls, each

pocket having a form and size complementary with respect to a corresponding free end of the shoulder pin element and locking means for the shoulder pin elements, said locking means comprising a recess for each bearing pocket located in the inside wall of the annular ring member in alignment with the corresponding bearing pocket and a releasable fastener for



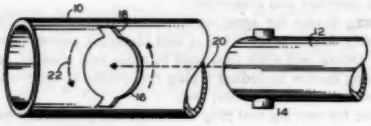
each recess, each recess having an initially open side and open ends, each recess and the corresponding shoulder pin element being receptive of one of said releasable fasteners, the initially exposed sides of said recesses being covered by one of said retention members, said loop having a path of movement throughout an arc of substantially a half circle for all positions of rotation of said annular ring member.

4,705,423

INTEGRAL FRAME CONNECTING APPARATUS

Kevin Smith, 796 Fifth Ave., Troy, N.Y. 12182

Filed Jun. 16, 1986, Ser. No. 874,390
Int. Cl.[4] F16B *7/00*
U.S. Cl. 403—254 **3 Claims**



1. A mechanism for removably joining elongate frame members comprising:

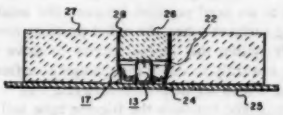
a first elongate member having at least one essentially cylindrical key-end section bearing key means composed of two essentially cylindrical projections disposed 180 degrees to each other and situated on and close to the end of said key-end section, said key means being passable through a keyway defined in a second tubular elongate member having a concave inner surface, said second tubular elongate member having an essentially circular keyway therein, said keyway further comprising two slots disposed on the circular margin 180 degrees to each other and perpendicular to the longitudinal axis of said second elongate member and positioned so as to accept insertion of said projections when presented with the projections' longitudinal axis essentially perpendicular to the longitudinal axis of said second elongate member, whereby said removable joining is effected by inserting the key means of said first elongate member into the keyway of said second elongate member and rotating it after insertion so that the axis of said projections is aligned with the axis of said elongate member of said second elongate member and thereafter biasing said projections in the direction opposite insertion into the keyway, bringing said projections' outer surfaces into registry with said inner concave surface of said second tubular elongate member.

4,705,424

STUD SYSTEM FOR SECURING ABRASION RESISTANT MEMBERS

Robert J. Raycher, and Charles C. Pease, both of Vincentown, N.J., assignors to KSM Fastening Systems Inc., Morrestown, N.J.

Filed Jun. 13, 1985, Ser. No. 744,803
Int. Cl.[4] F16B *12/04*
U.S. Cl. 403—266 **7 Claims**



1. A stud and clip combination of securing an abrasion resistant member of a prescribed thickness and having a clip engaging aperture therethrough to metallic surfaces to line such surfaces with the abrasion resistant member for protection against abrasion comprising:

an end weldable stud having an axial length less than the thickness of the abrasion resistant member to be secured and adapted to be welded to the metallic surface by a stud end welding technique; and

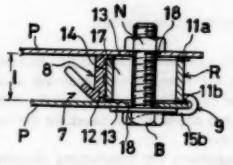
a spring retainer clip having a side wall portion with a radial dimension which resiliently engages the aperture of the abrasion resistant member and a stud engaging aperture of dimension to resiliently engage the end weldable stud whereby the spring retainer clip is secured upon the stud and into engagement with the aperture of the abrasion resistant member in order to secure the abrasion resistant member in place upon the metallic surface.

4,705,425

PANEL COUPLER

Toshiya Okawa, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Sep. 26, 1986, Ser. No. 912,835
Claims priority, application Japan, Sep. 30, 1985, 60-148218[U]
Int. Cl.[4] F16B *1/00, 37/04*
U.S. Cl. 403—376 **2 Claims**



1. A panel coupler for coupling together two facing panels at a predetermined distance from each other by passing a bolt throught the panels and tightening a nut on the bolt, comprising:

a plastic molding having cavity within a case-like spacer part, said cavity having a radially arranged opening and having aligned bolt insertion holes formed in top and bottom walls of the spacer part, and a clip part united to said spacer part to be fitted on one of said two panels; and

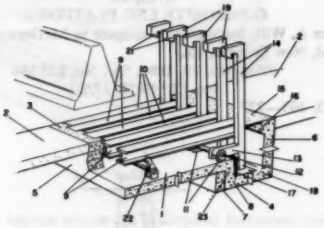
a reinforcement metal ring fitted into said cavity through said opening, said ring having a bolt passageway aligned with said insertion holes.

4,705,426

SECURITY AND DEFENSE BARRIER

Bernabe A. Perea, Rte. 145 Box 250A, Santa Fe, N. Mex. 87505

Filed Dec. 19, 1985, Ser. No. 810,500
Int. Cl.[4] E01F *13/00*
U.S. Cl. 404—6 **5 Claims**



1. A security and defense barrier comprising:

(a) a vault which is buried in a roadway, said vault including a top, a bottom, an approach end, and a shoulder end, in the bottom of the vault there being a step, the vertical surface of the step being designated a rise;

(b) a foundation which is under the approach end of the vault and disposed transverse to the roadway, the rise abutting against the foundation to prevent the barrier from moving during operation of the barrier;

(c) a plurality of beams spaced apart parallel to each other between shoulder end and the approach end, said beams being able to support normal vehicular traffic thereacross;

(d) a plurality of non-impact bearing pivot supports mounted on the bottom and inside of the vault transverse to the roadway;

(e) a pivot rod which rotatably extends through the plurality of pivot supports;

(f) a selected plurality of pivot arms, each said pivot arm having a first end and a second end, said pivot arms being rigidly affixed at said first ends to said pivot rod;

(g) a like selected plurality of barrier arms rigidly attached to said secone ends of the pivot arms, the longitudinal axis of each barrier arms being substantially perpendicular to the longitudinal axis of each corresponding pivot arm, each said barrier arm having a top vehicular traffic supporting surface, a dual purpose hook end for latching and vehicular snagging, and a butt end, said barrier arms being seated in the spaces between the beams when the barrier arms are in a down position, the top surfaces of the barrier arms and the beams forming a substantially even surface, said hook ends being shaped to provide two sharp angles, each hook on the hook end facing downward and inward when the barrier arm is in a down position, the hook ends being shaped to snag, hold, or tear a vehicle, when provided, which may impact the barrier arms, and, when the pivot rods are rotated, the barrier arms are raised;

(h) counterweight and shock absorbing pad means for balancing somewhat and assisting in raising the barrier arms, said counterweight and shock absorbing pad means being attached to the barrier arms underneath their butt ends to abut against the rise when the barrier arms are raised to their fully raised position with the top surfaces of the barrier arms bracing against the shoulder end, said means thereby assisting in vehicular impact absorption;

(i) a plurality of latches mounted on the bottom of the vault adjacent to the approach end, said latches engaging and latching the hook ends; and

(j) means for unlatching the latches from the hook ends to release and allow the barrier arms to rise;

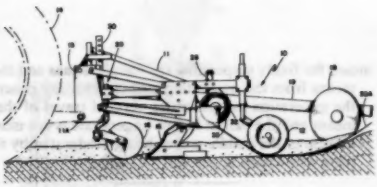
wherein during operation of the barrier, the barrier arms are initially locked into a down position which is parallel to the beams by the latches which are engaged with the hook ends of the barrier arms, when the vehicle to be stopped approaches the approach end, the spring latches release the barrier arms, the counterweight and shock absorbing pad means at the butt ends of the barrier arms assist the barrier arms to rotate on the pivot arms about the pivot supports and the hook ends of the barrier arms to be raised, the barrier arms being held in their upright position when the counterweight and shock absorbing pad means on the butt end contact the rise and the top surfaces contact the shoulder end, thereby positioning the barrier arms for stopping and damaging the vehicle.

4,705,427

EROSION CONTROL APPARATUS

David A. Atkins, Chanhassen, and Donald F. Atkins, Eden Prairie, both of Minn., assignors to Ero-Con, Inc., Eden Prairie, Minn.

Filed May 16, 1986, Ser. No. 863,853
Int. Cl.[4] E02B *7/00*
U.S. Cl. 405—36 **2 Claims**



1. Wheeled trailer means for installing a perforated film erosion barrier from a perforated film supply roll into the earth along an elongated furrow path and comprising:

(a) frame means for supporting said wheeled trailer means for movement along a predetermined path, said frame means including:

(1) wheeled support means for said wheeled trailer means;

(2) plow shoe means disposed forwardly of said frame means for creating an open furrow to receive one edge of an elongated perforated film;

(3) a furrow-covering disc disposed at the rear of said frame means;

(4) perforated foil supply roll support cradle means disposed generally intermediate said plow shoe means and said furrow-covering disc means for receiving a supply roll of perforated erosion barrier film thereon; and

(5) trailing boom means pivotally coupled to said frame means for pivotal movement about a generally vertical axis supporting said furrow-covering disc; and

(b) a generally vertically disposed post positioned at the forward end of said frame means, and vertical support cable means coupled between said generally vertically disposed post and said trailing boom means for controlling the vertical disposition and elevation of said furrow-covering disc; and

(c) a hydraulic cylinder and ram coupled between said frame means and said trailing boom means for adjustably positioning said trailing boom means relative to said frame means for controlling the path of travel of said furrow-covering disc along the edge of the furrow created by said plow shoe means.

4,705,428

WAVE GENERATING APPARATUS

Per F. Andersen, Hummeltoften 14, 2830 Virum, Denmark

Filed Mar. 7, 1986, Ser. No. 837,406
Claims priority, application Canada, Mar. 8, 1985, 476134
Int. Cl.[4] E02B *3/00*
U.S. Cl. 405—79 **17 Claims**

1. Wave making apparatus for deployment adjacent a body

of water and for generating wave motions in the body of water, comprising:

shore-mounted means for generating a vertical reciprocating motion above the body of water;

horizontally oriented paddle means for complete immersion in the body of water adjacent the generating means;

ballast means attached to the horizontally oriented paddle means; and

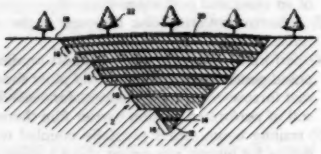
means for freely suspending the paddle means and the ballast means from the generating means, whereby generation of the generation means causes vertical travel of the paddle means and the ballast means to generate wave motion, the motion of the paddle means being moderated by the complete immersion in the body of water.

4,705,429

METHOD OF DISPOSING OF ASBESTOS WASTE MATERIAL

Anthony Natale, Maple Shade, N.J., assignor to GPAC, Inc., Cinnaminson, N.J.

Filed Apr. 10, 1986, Ser. No. 850,125
Int. Cl.[4] B09B *1/00*
U.S. Cl. 405—128 **18 Claims**



1. A method of disposing of asbestos waste material and covering at least a portion of an asbestos mine site, said method comprising:

locating an open pit asbestos mine from which fibrous asbestos has been removed for processing into useful products, said mine including an exposed surface from which said fibrous asbestos is subject to airborne release to thereby present a health hazard to the public due to potential airborne contamination,

depositing asbestos waste material into an inactive portion of said mine to cover at least a part of said exposed surface,

said waste material containing debris of useful products processed from fibrous asbestos, which products even in their processed state, are a health hazard to the public due to potential airborne contamination, and

covering said deposited asbestos waste material with a non-hazardous material sufficient to cover said deposited waste material to avoid airborne contamination by the previously exposed fibrous asbestos of said exposed surface of said mine, as well as the fibrous asbestos in the debris of the useful products in the asbestos waste material, to thereby minimize exposure to the public of the potential health hazard of both the covered portion of said asbestos mine and said waste material.

4,705,430

COMPOSITE LEG PLATFORM

Stephen A. Will, Spring, Tex., assignor to McDermott Incorporated, New Orleans, La.

Filed Jan. 29, 1986, Ser. No. 823,556
Int. Cl.[4] E02B *17/02*
U.S. Cl. 405—227 **5 Claims**

1. A composite leg platform comprising:

a. an elongated jacket with support legs, said legs having a reduced lower region;

b. A plurality of skirt piles embeded in the sea floor and connected to each said support leg;

c. a rigid connection between a said support leg and its respected plurality of skirt piles, said rigid connection being at an elevation above said reduced lower region of said support leg; and,

d. at least one slip connection coupling the same said support leg and said plurality of skirt piles, said slip connection configured to provide lateral support to said support leg while enabling said support leg to move axially with respect to said skirt piles, said slip connection coupling to said reduced lower region of said support leg and wherein axial, shear, torque, and bending moment forces are transferred from said support legs through said slip and rigid connections to said skirt piles.

4,705,431

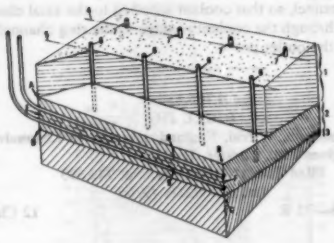
METHOD FOR FORMING A FLUID BARRIER BY MEANS OF SLOPING DRAINS, MORE ESPECIALLY IN AN OIL FIELD

Claude Gadelle, Rueil-Malmaison, and Hervé Petit, Vanves, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 20, 1984, Ser. No. 684,297
Claims priority, application France, Dec. 23, 1983, 83 20809
Int. Cl.[4] E02D *5/18*
U.S. Cl. 405—267 **13 Claims**

1. A method for injecting a fluid into a geological formation to form a barrier of said fluid across a predetermined surface having an elongated shape, the direction of elongation of this surface, or main direction, being distinct from the vertical, wherein said fluid is injected from a plurality of injection zones provided by a plurality of drains passing through said forma-

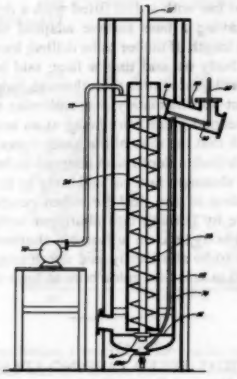
tion in a substantially horizontal direction, said drains being arranged vertically one above the other to provide a substantially planar barrier across the geological formation and the drains being drilled from the surface.



4,705,432
APPARATUS FOR PREPARING SULFUR PARTICLES HAVING UNIFORM SIZE DISTRIBUTION

Bruce Harbolt, Northridge; James T. Saake, Los Angeles, and Douglas J. Jackson, South Pasadena, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 678,633, Feb. 14, 1985, Pat. No. 4,595,350. This application Dec. 19, 1985, Ser. No. 811,529
Int. Cl.[4] B65G 53/48
U.S. Cl. 406—60 **3 Claims**

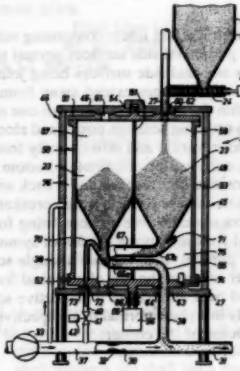


1. A molten sulfur lift for providing a constant molten sulfur head with a varying inlet head comprising a vertical outer housing having a molten sulfur inlet, a cylindrical, vertical inner housing having an open bottom and an open top spaced above the floor of said outer housing and forming a vertical annular passageway between the walls of said inner and outer housings, a molten sulfur discharge pipe in fluid communication with the upper portion of said inner housing below the open top thereof passing outwardly and downwardly from said inner housing through said outer housing for removing molten sulfur from said lift, a rotatable screw confined within said inner housing extending substantially from the open bottom of said inner housing to said molten sulfur discharge pipe for lifting said molten sulfur from the lower volume enclosed by said outer housing through said open top of said inner housing and into said annular passageway, flapper valve means positioned within said molten sulfur discharge pipe for closing said discharge pipe and interrupting the flow of molten sulfur therethrough, and conduit means in fluid communication between the lower volume enclosed by said outer housing and said discharge pipe at a point downstream from said flapper valve means for conveying molten sulfur from said lower volume to said discharge pipe.

4,705,433
PNEUMATIC TRANSPORTATION SYSTEM WITH A MATERIAL FEEDER

Roine Brännström, Finspong, Sweden, assignor to Asea Stal Aktiebolag, Finspong, Sweden

Filed May 9, 1986, Ser. No. 861,212
Claims priority, application Sweden, May 9, 1985, 8502301
Int. Cl.[4] B65G 53/46
U.S. Cl. 406—63 **14 Claims**



1. A pneumatic transportation system for transferring a particulate material from a storage container to a receiving unit, the system comprising:

a material feeder with a closed vertically oriented housing having an upper and a lower end wall;

a rotor turnably located in the housing;

drive means for rotating the rotor through different angular positions in the housing, the rotor having an upper and a lower end wall and at least one material chamber defined therebetween;

sealing surfaces cooperating between the end walls of the housing and the rotor;

means defining an inlet to the material chamber in the upper end walls of the housing and the rotor, respectively;

means defining an outlet in the lower end walls of the rotor and the housing, respectively, the outlets being arranged so that the inlets and outlets of the housing and the rotor are positioned immediately opposite to each other at different angular positions of the rotor in relation to the housing;

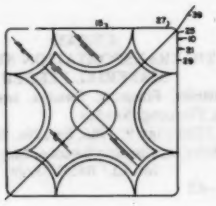
a bent outlet conduit integrated at a terminal end of the material chamber, the outlet conduit being connected to an opening of the rotor to form a material lock and an L-type valve means for the particulate material between the material chamber and the outlet of the rotor, and gas conduit means connecting the outlet conduit forming the L-valve means to a gas supply means for discharging the particulate material from the material chamber when the drive means rotates the rotor to an appropriate angular position for aligning the outlet of the rotor to the outlet of the housing.

4,705,434

SCALLOPED POLYGONAL CUTTING INSERT

John H. Patterson, Hazel Park, and Thomas J. Bernadic, Madison Heights, both of Mich., assignors to GTE Valenite, Troy, Mich.

Filed Dec. 22, 1986, Ser. No. 944,789
Int. Cl.[4] B23B *27/22*
U.S. Cl. 407—114 **1 Claim**



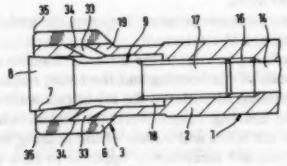
1. A polygonal indexable cutting insert comprising substantially parallel faces and peripheral side surfaces normal to said parallel faces, said faces and said side surfaces being joined to form corners, a pair of cutting edges extend away from each corner substantially within the plane of a respective one of said faces, a plurality of chip breaking scallops positioned along the cutting edges and extend inwardly and downwardly from the respective cutting edge, each scallop comprises a bottom arcuate surface forming a positive rake surface and a back arcuate surface joining said bottom surface to form a chip breaker, said bottom and back surfaces of respective scallops being formed as segments of a conical frustum having an axis of symmetry, each of said respective parallel faces include a single scallop positioned at each corner wherein the axis of a conical frustum forming said bottom and back surfaces of a respective scallop is positioned substantially in a plane normal to a respective face and lying along the bisector of the corner.

4,705,435

REAMER

Johannes Christoffel, Gipf-Oberfrick, Switzerland, assignor to Dihart AG, Dulliken, Switzerland

Filed Sep. 16, 1986, Ser. No. 908,050
Claims priority, application European Pat. Off., Sep. 19, 1985, 85111675.6
Int. Cl.[4] B23D *77/10*
U.S. Cl. 408—59 **9 Claims**



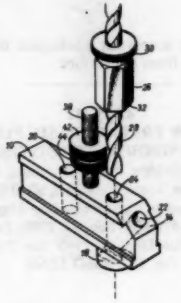
1. A reamer with coolant supply, the reamer comprising:
a reamer shank having an axial channel to convey coolant, the axial channel having a widened portion and an internally threaded portion therein;
a cutter head about an end of the reamer shank, the cutter head having a plurality of cutters and an outlet port extending from the axial channel to outside of the cutter head between the cutters; and
a conical screw accommodated in the axial channel and extending through the widened portion thereof to expand the reamer shank at the cutter head, the conical screw having an at least partially threaded shank for connection to the internally threaded portion of the reamer shank and a coolant passage, the reamer shank and conical screw defining therebetween at the widened portion an annular ring channel, so that coolant supplied to the axial channel flows through the coolant passage to the ring channel and out of the outlet ports.

4,705,436

DRILL JIG

Ian M. Robertson, Wirral, England, assignor to Channelwood Preservations Ltd., Chester, England

Filed Jun. 11, 1985, Ser. No. 743,595
Int. Cl.[4] B23B *49/00*
U.S. Cl. 408—72 R **12 Claims**



1. A drill jig for use with a drill fitted with a drill bit, comprising a body having a base surface adapted to be placed against a face of a length of timber to be drilled; locating means for locating said body on said timber face; said body having first and second drill guide bores therethrough, said first guide bore being at least approximately perpendicular to said base surface and said second guide bore being at an acute angle to said first bore such that the axes of the guide bores intersect in the timber to be drilled; a depth stop adapted to be connected to the drill bit; an abutment face on said body so as to limit the depth of penetration of the drill bit when received in said second guide bore by coming into abutment with said abutment face on said body; and an adjustable abutment disposed on the body so as to be abutted by said depth stop when said drill bit is received in said first guide bore to limit the depth of penetration.

4,705,437

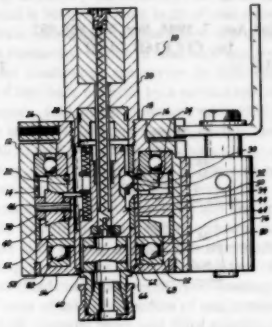
REVERSIBLE DUAL SPEED TAPPING ATTACHMENT

Allan S. Johnson, Newport Beach, Calif., assignor to Tapmatic Corporation, Irvine, Calif.

Filed Feb. 4, 1985, Ser. No. 697,857
Int. Cl.[4] B23G *3/02, 5/14*
U.S. Cl. 408—139 **2 Claims**

1. A tapping attachment including:
a housing;
a forward drive member received within the housing and associatable with a source of rotational drive to cause rotation of the forward drive member relative to the housing at a first speed;
a reverse drive member received within the housing for rotation relative thereto in a counterdirection to the direction of rotation of the forward drive member at a second speed,
means for causing simultaneous counter-rotation of the forward and reverse drive members at said first and second speeds;
a free axially floating tapping spindle associatable with the forward drive member to cause rotation of the spindle

therewith at said first speed and associatable with the reverse drive member to cause counter-rotation of the



spindle therewith relative to the forward drive member at said second speed, and

said first speed being greater than said second speed.

4,705,438

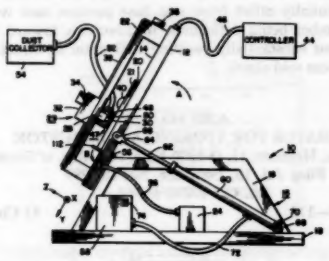
MACHINING CENTER HAVING AN INCLINABLE VACUUM-HOLDING WORKTABLE

Sanford S. Zimmerman, Westport, and Louis W. Syarto, Fairfield, both of Conn., assignors to Wesflex International Corporation, Westport, Conn.

Filed Aug. 20, 1986, Ser. No. 898,221

Int. Cl.[4] B23C *1/12*; B23Q *1/04*

U.S. Cl. 409—132 **33 Claims**



1. A machining center for the machining of workpieces of varying size and of various materials comprising:

a worktable supported by a base assembly, said worktable comprising a worksurface upon which a workpiece is supported during machining, said worktable further comprising a vacuum holding means for immovably holding said workpiece during the machining thereof;

a workhead assembly attached to said worktable and comprising a tool for machining said workpiece, said workhead assembly further comprising means for moving said tool relative to said workpiece; and

means for controllably inclining said worktable and attached workhead assembly relative to said base assembly such that said workpiece can be immovably held in an inclined position during the machining thereof whereby dust and chips resulting from said machining are removed from said workpiece due to the force of gravity.

23. A method of removing dust and chips from a workpiece during the machining of said workpiece, the machining being accomplished by a machining center comprising a base assembly supporting a worktable having a vacuum holding means for immovably holding the workpiece and a machining tool coupled to a positioning means supported by said worktable, the positioning means being operable for positioning the tool in an X, Y and Z coordinate reference system relative to said workpiece, comprising the steps of:

positioning the workpiece on the worktable at a predetermined position relative the X, Y and Z coordinate reference system;

activating said clamp means for immovably holding the workpiece in the predetermined position; and inclining the worktable and activating said machine tool to machine said workpiece while the worktable is at an angle which is sufficient to permit the force of gravity to remove dust and chips from the workpiece during the machining of the workpiece.

4,705,439

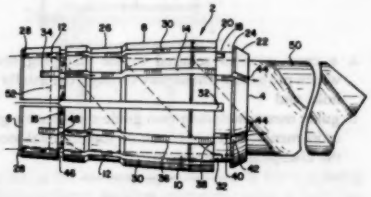
MACHINE TOOL COLLET CONTAINING MEANS FOR PASSING A CUTTING FLUID THERETHROUGH

William Hoyle, Knoxville, and Jammie Graves, Lenoir City, both of Tenn., assignors to General Electric Company, Detroit, Mich.

Filed May 12, 1986, Ser. No. 862,612

Int. Cl.[4] B23B *31/20, 51/06*; B23C *5/28*

U.S. Cl. 409—136 **6 Claims**



1. A machine tool collet comprising:

(a) a collet body having a wall having an outer and inner surface, the inner surface of the wall defining a hollow shaft wherein the shaft has a forward open end for receiving a cutting tool and an opposed rearward open end insertable into a tool holder means;

(b) at least one first axial slit running through the wall of the collet body and thereby communicating with the shaft, the first axial slit having an opening into the rearward open end of the shaft and terminating before the forward open end of the shaft;

(c) at least one second axial slit running through the wall of the collet body and thereby communicating with the shaft, the second axial slit having an opening into the forward open end of the shaft and terminating before the rearward open end of the shaft; and

(d) a grind relief recess; and

(e) means in addition to the grind relief recess connecting the first and second axial slits, said connecting means enabling a machine fluid to readily flow from the rearward open end of the shaft to the forward open end of the shaft when a cutting tool is in the tool cutting position within the shaft.

4,705,440

TOOL HOLDER FOR MILLING OR BORING MACHINE

Werner Babel, Pfronten-Meilingen, Fed. Rep. of Germany, assignor to MAHO Aktiengesellschaft, Pfronten, Fed. Rep. of Germany

Filed Dec. 18, 1985, Ser. No. 810,511

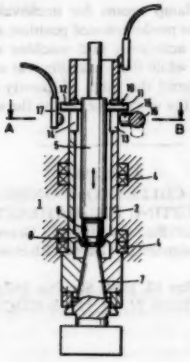
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1984, 3447595

Int. Cl.[4] B23C *5/26*

U.S. Cl. 409—233 **5 Claims**

1. A tool-clamping device for milling and drilling machines, comprising a tool spindle and a clamping arrangement with

clamping tongues, arranged centrally and longitudinally displaceably in the tool spindle, a rotational position indicator for resetting the tool spindle into a tool-changing position, and a positioning mechanism for the tool spindle, wherein the tool spindle has an axially elongated hole, and wherein the positioning mechanism includes



a. a cross member secured to the clamping arrangement which projects without play through the axially elongated hole, and

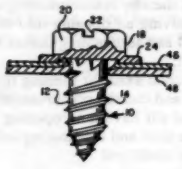
b. guide means including two guide surfaces for guiding the cross member therebetween on longitudinal movement of the clamping arrangement.

4,705,441

SELF LOCKING SHEET METAL SCREW

Larry J. Arnold, Statesville, N.C., assignor to Arnold Technologies, Inc., Charlotte, N.C.

Filed Feb. 12, 1986, Ser. No. 828,487
Int. Cl.[4] F16B *39/282, 35/04*
U.S. Cl. 411—188 **10 Claims**



1. A screw fastener comprising:

a generally cylindrical shank;

an enlarged head on one end of said shank, said head having drive tool engaging means;

said shank having at least one helical thread thereon;

said head having a lower annular peripheral flange concentric to the axis of said shank, said flange having a recessed portion beneath said head;

a plurality of equi-angularly spaced teeth beneath said head and within said recess, each tooth being fixed to said head and to said shank, and each tooth having a tooth height equal to the lateral distance the tooth extends outwardly from said shank;

each tooth having a leading flat face and a trailing curved surface; and

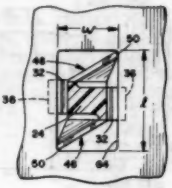
each successive tooth, except the shortest tooth, extending incrementally further outwardly from said shank than an adjacent tooth.

4,705,442

QUARTER TURN FASTENER

Joseph G. Fucci, Abington, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 7, 1986, Ser. No. 848,492
Int. Cl.[4] F16B *19/00*
U.S. Cl. 411—510 **18 Claims**



1. A fastener comprising:

an enlarged head portion;

an axially elongated, relatively rigid shank extending from said head portion;

a first series of leg members joined to said shank and extending generally radially therefrom, said leg members being axially spaced and readily deflectable in a direction toward said heat portion but offering substantial resistance to deflection in a direction away from said head portion; and,

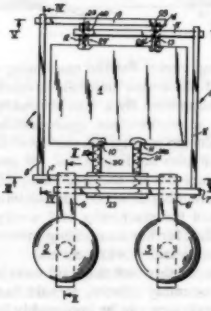
a first resilient wing-like member having a relatively rigid base portion extending along said shank at an angle relative to the axis of said shank, said wing-like member having a body which is relatively flexible and resilient and which extends radially from said base to a free end portion which lies at a location spaced radially outward and circumferentially offset from said base portion, said wing-like member being deflectable in directions toward said shank but substantially resisting deflection in directions away from said shank.

4,705,443

APPARATUS FOR STOKING A COMBUSTOR

Lothar Teske, Hegelstr. 15, D-5000 Köln, Fed. Rep. of Germany

Filed Jul. 10, 1986, Ser. No. 883,997
Int. Cl.[4] B65G *65/42*
U.S. Cl. 414—173 **12 Claims**



1. In an apparatus for loading a combustor with viscous bulk material, particularly coal slurry, comprising two silos provided side by side and at least one continuous conveyor associated therewith which can transport said bulk material from said silos, said continuous conveyor having at least two outlet openings leading to every fuel-feeder of said combustor and spaced one after the other in the feed direction of said bulk

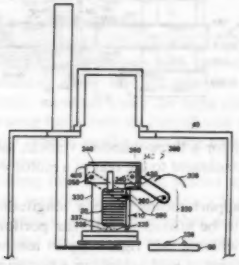
material and said fuel-feeders opening into said combustor so that said bulk material fed through said fuel-feeders is distributed nearly uniformly throughout said combustor when said bulk material is being fed from both of said silos, the improvement wherein said apparatus has a first one of said continuous conveyors connected to one of said silos and each of said first ones of said continuous conveyors is followed in said feed direction of said bulk material by a second one of said continuous conveyors, said outlet openings of both first continuous conveyors being alternately closable, each of said outlet openings of both of said first continuous conveyors opening into an inlet opening of one of said second continuous conveyors, said second continuous conveyors being formed to feed said bulk material into a common intermediate silo and from said intermediate silo to a third one of said continuous conveyors, said intermediate silos having at least two intermediate silo outlet ducts leading to each one of said fuel-feeders of said combustor, and said third continuous conveyors leading to at least two additional ones of said fuel-feeders of said combustor feedable with said bulk material from said third continuous conveyors.

4,705,444

APPARATUS FOR AUTOMATED CASSETTE HANDLING

Barclay J. Tullis, Palo Alto; John S. Bailey, Sunnyvale; D. R. Gunawardena, Union City, and Ulrich Kaempf, Los Altos, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 24, 1985, Ser. No. 759,013
Int. Cl.[4] B65G *65/02*
U.S. Cl. 414—226 **14 Claims**



1. An automated cassette handler for transporting integrated circuit wafers held in a wafer cassette within a canopy, said cassette having at least a closed side and an oppositely directed open side, said canopy coupled to a piece of integrated circuit processing equipment, said handler comprising:

a swinger housing within the canopy;

at least two parallel rotation arms coupled between the canopy and the swinger housing so that the swinger housing can be rotationally moved along an arc within the canopy while maintaining the swinger housing in a substantially constant plane with respect to the canopy;

driver means coupled by a shaft to the rotation arms for rotating the swinger housing;

gripper means coupled to the swinger housing for grasping and holding the cassette while the swinger housing is rotated to lift and transport the cassette;

depressor means pivotally coupled to the swinger housing and being swingably mounted for movement in a horizontal plane for retaining the wafers within the cassette by engaging the wafers along said open side of said cassette while the cassette is lifted and transported;

first sensor means coupled to the gripper means for sensing whether the cassette has been gripped by the gripper means;

second sensor means coupled to the depressor means for sensing the position of the depressor means; and

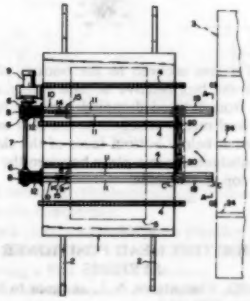
third sensor means coupled to at least one of the rotation arms for sensing the position of the swinger housing.

4,705,445

APPARATUS FOR EXCHANGING METAL MOLDS

Tsuneharu Morita; Toshiharu Ikeyama, both of Suzuka; Osamu Iwaki, and Hisao Katsuta, both of Nagoya, all of Japan, assignors to Kobayashi Bansokiki Co., Ltd., Nagoya, Japan

Filed Jul. 25, 1985, Ser. No. 759,057
Claims priority, application Japan, Jul. 30, 1984, 59-116980[U]; Jul. 30, 1984, 59-116981[U]
Int. Cl.[4] B65G *65/00*
U.S. Cl. 414—280 **11 Claims**



1. An apparatus for exchanging metal molds for a molding machine which performs molding operations using at least one such mold; said apparatus including a mold carriage capable of having mounted thereon at least two metal molds and a mold transfer and exchange-transport truck unit capable of horizontally transporting a metal mold to be exchanged with said one mold in said molding machine between said carriage and said molding machine, wherein said mold transfer and exchange-transport truck unit includes a conveying means for giving and receiving each metal mold in a horizontal plane; said conveying means comprising a guide rail, an elongated yieldable or flexible member mounted for sliding movement along said guide rail, and an extension rail segment mounted for pivotal movement to a vertical support shaft disposed on said mold transfer and exchange-transport truck unit on a side facing said molding machine; said vertical shaft being positioned so as to permit said extension rail segment to swing into a position aligned with and forming an extension of said guide rail.

4,705,446

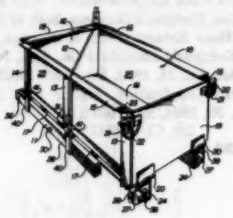
HOISTING AND DUMPING CONTAINER

Richard J. Miller, 279 Esther St., Naples, Fla. 33942

Filed Feb. 26, 1986, Ser. No. 832,891
Int. Cl.[4] B65G *65/24*
U.S. Cl. 414—422 **10 Claims**

1. A hoisting and dumping container comprising a container lifting frame adapted for connection releasable with a hoisting and lowering device, said frame including three-sided frame including a pair of side frame bars and one end bar, a box adapted to hold a substantial amount of material requiring elevating and/or lowering or dumping, a fixed transverse pivot shaft extending between said pair of side frame bars, a transversely extending sleeve fixed to the bottom of said box, said sleeve being freely rotatable on said shaft, said pivot shaft nad sleev defining a pivot axis forwardly of the longitudinal center of the box and forwardly of its center of gravity, whereby the box is biased by gravity toward a tilted material dumping position relative to the frame, readily releasable connecting means on the box and frame for locking the box and frame in

substantially parallel relationship, cooperative stop means on the box and frame engageable when the box and frame are in parallel relationship and arresting swinging movement of the box relative to the frame in one direction beyond said parallel relationship but allowing the box to swing freely relative to the frame in an opposite direction on its pivot axis to a dumping



position, skid means secured to the bottom of the box and pivoting with the box relative to said frame when the box swings to or from a tilted dumping position relative to said frame, and wheel menas attached to the skid means and projecting somewhat below bottom faces of the skid means, said frame being substantially in a plane between the bottom of the box and thee top of the skids.

4,705,447

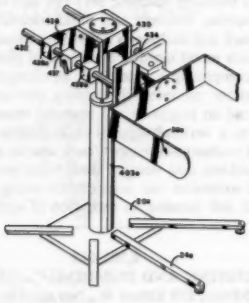
ELECTRONIC TEST HEAD POSITIONER FOR TEST SYSTEMS

Nathan R. Smith, Vincentown, N.J., assignor to inTEST Corporation, Cherry Hill, N.J.

Division of Ser. No. 522,635, Aug. 11, 1983, Pat. No. 4,589,815, which is a continuation-in-part of Ser. No. 411,311, Aug. 25, 1982, Pat. No. 4,527,942. This application Jul. 10, 1985, Ser. No. 753,684

Int. Cl.[4] B66F *11/00*; B25J *1/12*

U.S. Cl. 414—590 **14 Claims**



1. A system for maintaining an object in a substantially weightless condition without the effect of gravity comprising:

support means having a first continuously vertical axis;

positioner means coupled to the support means and having a vertical movement with respect to the support means and movement in a horizontal plane, the positioner means including cradle means for attaching the object;

counterbalancing means coupled to the positioner means to provide a substantially weightless condition to the positioner means with the object attached whereby said positioner means is free to manually move vertically from a predetermined lowermost to a predetermined uppermost position free of mechanical restraints between the two positions; and

the positioner means including continuously horizontal linear motion guide means for providing horizontal movement of the object with respect to the support means, the positioner means including a second continuously vertical axis, means for pivotally mounting the object about the second continuously vertical axis, at least one of said continuously vertical axes being free to rotate as the positioner means is manually extended, the positioner means having an additional continuously horizontal axis for providing rotation of the object about said additional continuously horizontal axis whereby as the object is extended in the horizontal plane and rotated, the two vertical axes, the horizontal linear motion guide means, and the additional horizontal axis themselves support the weight of the positioner means with the cradle means and the attached object without the effect of gravity.

4,705,448

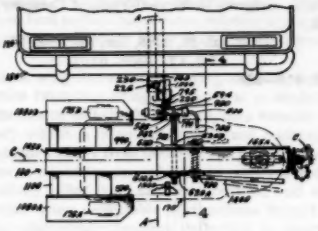
CARRIER FOR THREE WHEELED VEHICLES

Edwin M. Mungons, 5906 Cresthaven, Apt. D-1, Toledo, Ohio 43614

Filed Jan. 23, 1985, Ser. No. 694,020

Int. Cl.[4] B60P *3/06*; B60R *9/00*

U.S. Cl. 414—462 **1 Claim**



1. A carrier for a three-wheeled vehicle, said carrier being adapted for attachment to the rear of a motor vehicle, comprising:

(a) rigid support means, with a longitudinal central axis adapted to be affixed to the rear portion of said motor vehicle, wherein said rigid support means projects away from the rear of said vehicle in a posterior direction;

(b) a first pivot member having longitudinal extent, affixed to said first pivot member wherein said first pivot member is adapted to pivot in a vertical plane relative to said rigid support means, said first pivot member having a first face and a second face;

(c) a second pivot member pivotally mounted to said first pivot member, wherein said second member is adapted to pivot relative to said first pivot member in a plane which is perpendicular to the longitudinal central axis of the rigid support member, said second pivot member having a first side and a second side;

(d) carrying platform means, with an upper surface, rigidly affixed to the upper surface of said second pivot member wherein the upper surface of said carrying platform is adapted to carry a there-wheeled vehicle, which platform means is comprised of a longitudinal extending intermediate wheel track and two lateral wheel tracks on each side of said intermediate track;

(e) locking and unlocking means affixed adjacent said second pivot member, wherein said locking and unlocking means is comprised of a plate member affixed against the first side of said second pivot member, and which plate member is adapted to pivot away from a part of said second pivot member to release said second pivot member for pivotal movement.

4,705,449

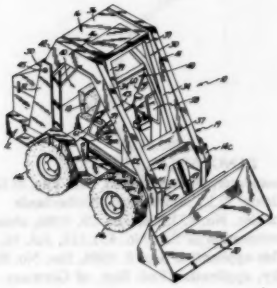
SKID-STEER VEHICLE

Leslie L. Christianson, Rte. 3, Box 118; Ralph Alcock, 127 Jefferson Ave. South; Donell P. Froehlich, 2120 Derdall Dr., all of Brookings, S. Dak. 57006, and Kellen J. Chicoine, R.R. 1, Box 248, Elk Point, S. Dak. 57025

Continuation of Ser. No. 753,300, Jul. 10, 1985, abandoned. This application Mar. 30, 1987, Ser. No. 33,903

Int. Cl.[4] B66F 9/00

U.S. Cl. 414—68.5 4 Claims



1. A skid-steer vehicle comprising:

a body having a right and a left side and a front and a rear pair of ground-engaging wheels with two of the wheels rotatably mounted along the left side and two of the wheels rotatably mounted along the right side;

means for operating the wheels on the left side at a different speed than the wheels on the right side to create a skid-steering movement;

a housing including first and second spaced apart support members each support member having a forward and a rearward upwardly extending member joined to each other at an upper end portion by a connecting member such that the housing defines a driver's compartment and the first and second support members defining first and second side access openings with the driver's compartment being located substantially between the front and rear wheels;

a loader arm having a downwardly extending rearward portion, a forward portion and a middle portion, the rearward portion being pivotally attached to the rearward member of the support member rearward of the access openings at an upper portion of the rearward member and wherein the loader arm, when either in an up position or a down position, does not extend into the access openings;

hydraulic cylinder means for raising and lowering the loader arm and wherein the hydraulic cylinder means is pivotally attached to the body at a position forward of the access opening at one end and attached to the loader arm at another end such that when the loader arm is either in the up or the down position, the hydraulic cylinder means does not interfere with the access openings; and

wherein the first and second spaced-apart support members and the connecting member of the housing define an arched upper portion of the access opening and the rearward portion, forward portion, and middle portion of the loader arm are in general alignment with the arched portion of the housing when the loader arm is in the down position.

4,705,450

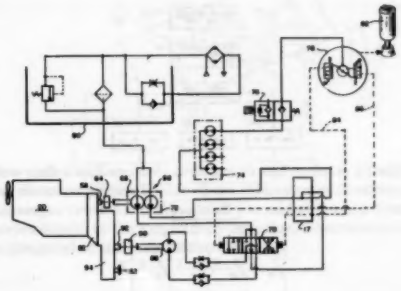
SINGLE ENGINE EXCAVATOR WITH REMOTE CONTROL

John W. Gano, New Philadelphia, Ohio, assignor to The Gradall Company, New Philadelphia, Ohio

Filed Dec. 11, 1985, Ser. No. 807,616

Int. Cl.[4] B60K 17/28, 26/02

U.S. Cl. 414—687 23 Claims



1. A material handling vehicle capable of over-road travel to and from a job site comprising:

a. a lower truck chassis supported by a plurality of wheels, at least two of which are drive wheels, said lower truck chassis having a first operator's station;

b. an upper structure mounted on said lower chassis and having a second operator's station;

c. a manipulatable material handling implement mounted on said upper structure;

d. an engine mounted on said lower chassis, said engine being controllable from said first operator's station;

e. hydraulic power means powered by said engine, said hydraulic power means being controllable from said second operator's station, said hydraulic power means comprising:

(i) a hydraulic drive means; and

(ii) an implement power means coupled to said material handling implement for manipulating said material handling implement; and

f. a powershift transmission mounted on said lower chassis, said transmission haiving a primary input means coupled to said engine, a secondary input means coupled to said hydraulic drive means and an output drive means coupled to said drive wheels, so that said engine and said primary input means or said hydraulic drive means and said secondary input means may drive through said transmission to drive said drive wheels.

4,705,451

ROBOT CONTROL APPARATUS

Shunji Mori; Shinobu Tajima, and Atsushi Itoh, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 510,864, Jul. 5, 1983, abandoned. This application Dec. 1, 1986, Ser. No. 936,963

Claims priority, application Japan, Jul. 2, 1982, 57-114905

Int. Cl.[4] B25J 9/00

U.S. Cl. 414—70 4 Claims

1. A robot control apparatus of a type adapted to control plural robots, comprising:

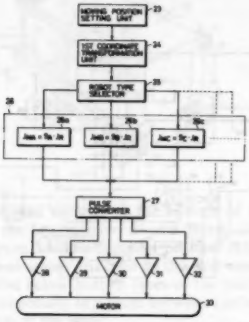
a moving position setting unit for setting moving positions of a hand of a robot based on a coordinate system of the hand;

a first coordinate transformation unit connected to said moving position setting unit for transforming an output

from said setting unit into information in a predetermined general coordinate system;

a selector connected to said first coordinate transformation unit for changing destinations of output information from said first coordinate transformation unit in dependence upon which of said plural robot is to be controlled;

a second coordinate transformation unit connected to said selector and having a pluarality of transformation sections for transforming outputs of said general coordinate system



into coordinate system information inherent to that one or ones of said plural robots to be presently controlled, the output from said first coordinate transformation unit being applied selectively to said transformation sections by said selector; and

means connected to said second coordinate transformation unit for producing signals for driving said one or ones of said robots to be presently controlled, in response to output information from said second coordinate transformation unit.

4,705,452

STATOR VANE HAVING A MOVABLE TRAILING EDGE FLAP

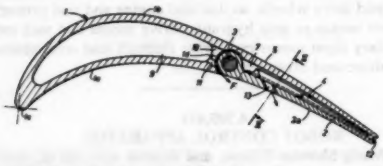
Georges Karadimas, Vanves, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA), France

Filed Aug. 14, 1986, Ser. No. 896,239

Claims priority, application France, Aug. 14, 1985, 85 12366

Int. Cl.[4] F01D *9/02;* **F04D** *29/56*

U.S. Cl. 415—115 **8 Claims**



1. a turbine stator vane comprising:

(a) a first wall defining a first, concave surface the first wall having a chord dimension d;

(b) a second wall attached to the first wall to form a leading edge portion of the stator vane, the second wall defining a second, convex surface; an intermediate portion so as to define a first cooling chamber with the first wall and further defining a first trailing edge portion, the second wall having a chord dimension d' such that $d' > d$;

(c) a movable flap having an upstream portion, a second trailing edge portion and a third, concave surface;

(d) attaching means to pivotally attach the upstream portion of the flap to the intermediate portion of the second wall such that the first and third concave surfaces are substantially continuous, that the flap is movable about an axis extending generally perpendicular to a chord of the stator vane and such that a second cooling chamber is defined by the intermediate portion, and the first and second trailing edge portions; and,

(e) means to move the flap about the axis.

4,705,453

TANGENTIAL BLOWER

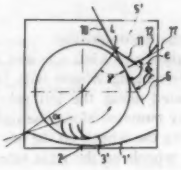
Reinhold Hopfensperger, Dietelskirchen, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

Continuation of Ser. No. 823,966, Jan. 29, 1986, abandoned, which is a continuation of Ser. No. 631,133, Jul. 16, 1984, abandoned. This application Sep. 2, 1986, Ser. No. 901,987

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1983, 3326651

Int. Cl.[4] F04D *29/66*

U.S. Cl. 415—119 **1 Claim**



1. A miniature tangential air blower comprising: a housing; a rotor having a radius; said rotor being rotatably mounted in said housing about a predetermined axis, said rotor including blades having edges extending parallel to said axis; a baffle plate fixed in said housing and partly enclosing said rotor; and a vortex former fixed in said housing, said baffle plate and said vortex former defining an inlet at one side of said housing and defining an outlet at the opposite side of said housing; said baffle plate and said vortex former being positioned to direct air in largely the same direction at the inlet and outlet, said housing having side walls at least partly enclosing said rotor, said baffle plate being largely spiral in shape and continuously departing from said rotor from a first point of closest proximity to the rotor, said baffle plate having a bent end, said vortex former having an inlet or suction sided leg which, from a second point of its greatest proximity to said rotor, continuously departs therefrom in an upstream direction as viewed in a direction of air flow, said inlet leg being substantially straight and having an imaginary straight continuation constituting a tangent to the rotor, said vortex former having a substantially straight central leg that has a length greater than one-fourth the rotor radius and that departs continuously from said second point at an angle δ from said tangent; the angle δ being sufficiently small such that an imaginary upstream extension of said central leg is spaced from said rotor; said vortex former having a pressure sided leg extending at an angle ϵ from said tangent in a curved or several times bent off manner to an edge of said housing; wherein ϵ being a plurality of times greater than δ.

4,705,454

TURBOMACHINE CASING WITH CONTAINMENT STRUCTURE INTENDED TO CONTAIN FRACTURED ROTATING PARTS

Jean G. Bouiller, Brunoy, and Marcel R. Soligny, Chevilly Larue, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Continuation of Ser. No. 615,588, May 31, 1984, abandoned. This application Jul. 9, 1986, Ser. No. 883,845
Claims priority, application France, Jun. 9, 1983, 83 09552
Int. Cl.[4] F04D *29/40*
U.S. Cl. 415—197 **9 Claims**

1. In a turbo-jet engine:
a casing;
a rotor disc carrying blades and being mounted within said casing;
auxiliary equipment mounted on the outside of the casing and subtending an angle centered on an axis extending longitudinally of said engine; and
a retaining structure disposed about a stage of the rotor blades and comprising an inner annulus, a honeycomb structure, and an external skin, wherein
said inner annulus extends circumferentially about substantially the entire stage of the rotor blades at a location radially inward of said auxiliary equipment, a thickness of said internal annulus being greater in a portion thereof that is adjacent said auxiliary equipment than in another portion thereof, said portion of greater thickness subtending an angle that includes said angle subtended by said auxiliary equipment,
said honeycomb structure is disposed externally of said inner annulus and extends circumferentially, subtending an angle that is not subtended by said auxiliary equipment, said honeycomb structure not extending into said angle subtended by said auxiliary equipment, and
said external skin is disposed externally of said honeycomb structure.

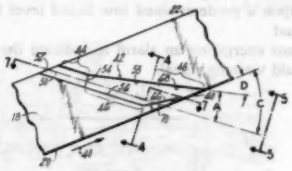
4,705,455

CONVERGENT-DIVERGENT FILM COOLANT PASSAGE

Michael K. Sahm, Ellington, and Robert Milano, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 23, 1985, Ser. No. 812,092
Int. Cl.[4] F01D *5/18*
U.S. Cl. 416—97 R **14 Claims**

1. A cooled wall having an internal surface defining a portion of a coolant compartment and an external surface adapted to have a hot gas flowing thereover in a downstream direction tangent to said external surface, a coolant passage through said wall having an inlet communicating with said compartment for receiving coolant fluid therefrom and an outlet at said external surface, said passage including, in series flow relation, a metering portion comprising a flow area of constant cross section for metering the flow of coolant fluid through said passage, a diffusing portion having an increasing cross-sectional flow area in the direction toward said outlet, and a nozzle portion terminating at said outlet, said nozzle portion including first wall surface means defining a flow path oriented to direct a flow of fluid therefrom in the generally downstream direction at a shallow angle relative to said external surface, wherein said



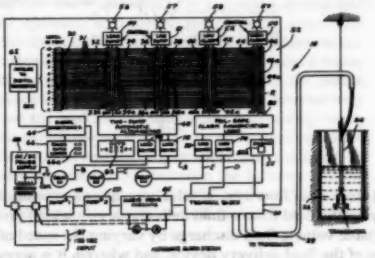
flow path simultaneously diverges to said outlet in a longitudinal direction perpendicular to the downstream direction, and converges toward and substantially to said outlet in a direction perpendicular to the longitudinal direction, wherein said outlet is elongated in the longitudinal direction.

4,705,456

CONTROL PANEL STRUCTURE FOR A LIQUID PUMPING STATION

John A. Gardeen, St. Paul, Minn., assignor to Consolidated Electric Co., St. Paul, Minn.

Filed Aug. 8, 1986, Ser. No. 894,624
Int. Cl.[4] F04B *49/02, 49/06*
U.S. Cl. 417—7 **3 Claims**



1. In connection with an apparatus for sensing a liquid level within and disposing of liquid from a sump accumulator, a panel control structure embodying appropriate circuitry for its operation; having in combination
a liquid level indicator having indicia indicating liquid levels in connection with a sump,
a plurality of vertical control columns having spaced incremental contact receptacles corresponding to said indicia,
signal-increment lines in connection with corresponding of said indicia and said contact receptacles,
contact elements disposable into said receptacles engaging said increment lines and setting parameters of liquid levels,
means reducing the level of liquid in said sump to an analog value and providing an analog signal,
said signal increment lines each represent an increment of said analog signal and together represent the entire analog signal excursion,
a pair of said control columns respectively being in circuit with a first and second pump,
said contact elements being set into said receptacles at parameters of liquid levels at which said pumps are respectively predetermined to run and to stop,
means automatically causing to become energized said increment lines which correspond to and are within the param-

eters of said liquid levels as sensed by said liquid level indicating indicia,

means in connection with said control columns visually indicating that a pump control circuit is energized,

one of said control columns has incremental contacts to energize a warning signal that an operating pump has not been deenergized when it otherwise should be stopped upon a predetermined low liquid level being indicated, and

means energizing an alarm to indicate the malfunction of said warning signal.

4,705,457

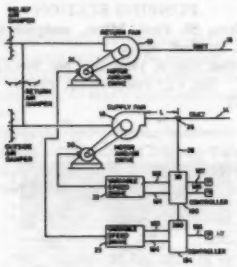
MONITORING OF FLUID FLOW

Manfred L. Belusa, Islington, Ontario, Canada, assignor to Belvin Properties Limited, Toronto, Ontario, Canada

Continuation of Ser. No. 571,747, Jan. 18, 1984, abandoned, which is a continuation-in-part of Ser. No. 491,878, May 5, 1983, abandoned. This application Sep. 16, 1986, Ser. No. 908,945

Int. Cl.[4] F04B *49/00*

U.S. Cl. 417—22 **6 Claims**



1. In a fluid flow system which includes a conduit for conveying the fluid from a fluid delivery device which provides a variable volume fluid discharge by varying the speed of operation of the fluid delivery device, and wherein it is necessary to generate a rate of flow signal which is proportional to the volume of fluid delivered by the fluid delivery device in use, the improved method of generating said rate of flow signal comprising the steps of;

(i) generating a first input signal which is proportional to the speed of the fluid delivery device,

(ii) inputting the first input signal to a curve fitter which programmed with the combined fluid delivery device/-conduit system characteristic curve according to the formula;

$$C_1q^2-KS^2=0$$

where;

C_1 is a constant (turbulent flow coefficient)

q is the rate of flow in the system,

K is constant $=P_2/S_2^2$

where;

P_2 is the maximum pressure generated by the fluid delivery device when it operates at design conditions,

S is the speed of the fluid delivery device,

S_2 is the speed of the fluid delivery device when operating at maximum design conditions

and to thereby generate said rate of flow signal, as an output signal from said curve fitter, which is proportional to fluid flow delivered by the fluid delivery device.

4,705,458

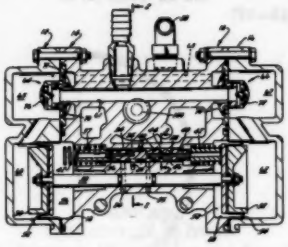
FLUID OPERATED PUMP

Wilfred St. Laurent, Marblehead, and Christos Athanassiu, Boston, both of Mass., assignors to Bellofram Corporation, Burlington, Mass.

Continuation-in-part of Ser. No. 403,758, Jul. 30, 1982, abandoned. This application Jun. 12, 1984, Ser. No. 619,407

Int. Cl.[4] F04B *43/06*

U.S. Cl. 417—46 **8 Claims**



1. A fluid operated pump, comprising:

a. first and second pistons rigidly fixed to each other;

b. a housing including first and second cylinders situated such that each of said pistons is in its respective cylinder;

c. first and second flexible seals acting to seal between said pistons and their respective cylinders so as to define inner and outer chambers in each of said cylinders;

d. said housing having an inlet conduit for receiving working fluid from a working fluid inlet port and first and second outlet conduits for exhausting said working fluid;

e. working fluid valving means comprising a spool valve which has first and second internal conduits in constant fluid communication with the inner chambers of said first and second cylinders, respectively, said spool valve being adapted to move to two different positions such that, in the first position, said first internal conduit is in fluid communication with said inlet conduit, and said second internal conduit is in fluid communication with said second outlet conduit, and, in the second position, said first internal conduit is in fluid communication with said first outlet conduit and said second internal conduit is in fluid communication with said inlet conduit;

f. means for moving said working fluid valving means between said first and second positions;

g. means for retaining said working fluid valving means at said first and second positions, including a groove in said spool valve and a pair of opposed, spring-loaded balls adapted to fit in said groove; and,

h. a cut-off valve for stopping the operation of said pump when the supply of fluid to be pumped is exhausted by interrupting fluid communication between said working fluid inlet port and said working fluid inlet conduit, and comprising a piston and a biasing means for biasing said piston to keep said cut-off valve in an open position during normal operation of the pump.

4,705,459

METHOD OF OBSERVING THE PUMPING CHARACTERISTICS OF A POSITIVE DISPLACEMENT PUMP

Paul H. Buisine, La Fouillouse, and Paul Dancer, St. Etienne, both of France, assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Aug. 19, 1985, Ser. No. 767,001

Claims priority, application France, Nov. 15, 1984, 84 17447

Int. Cl.[4] F04B *51/00*

U.S. Cl. 417—53 **9 Claims**

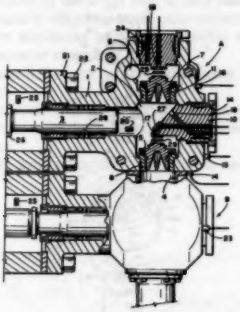
1. A method determining the flow rate delivered by a posi-

tive displacement pump in operation, the pump having at least one piston driven with a reciprocating motion in a chamber, which chamber is connected to a feed circuit for fluid to be pumped via an inlet valve and to an outlet circuit via a delivery valve, said valves being mechanically independent of the piston, the method comprising:

(a) counting the number of cycles performed by the pump in unit time;

(b) determining a corrected volume of the pump by:

(i) measuring the partial volumes of the chamber swept by



the piston between an instant at which the piston passes through its end position of maximum engagement in the chamber and a closure instant of the delivery valve, and also between an instant at which the piston passes through its opposite end position and an opening instant of the delivery valve;

(ii) subtracting the two partial volumes from the volume swept by the piston; and

(c) multiplying the number of cycles per unit time by the corrected volume of the pump so as to provide the flow rate.

4,705,460

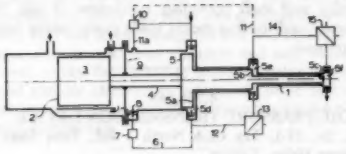
BOUNCE CHAMBERS FOR MULTI-CYLINDER LINEAR ENGINE COMPRESSORS

Anton Braun, 6421 Warren Ave. So., Minneapolis, Minn. 55435

Filed Feb. 26, 1985, Ser. No. 705,716

Int. Cl.[4] F02B *71/00*

U.S. Cl. 417—266 **12 Claims**



1. A bounce chamber combination for use in a free piston internal combustion engine driven multi-stage compressor comprising a plurality of coaxial compressor pistons in a plurality of compressor cylinders providing at least first and second stage gas pressure chambers, means providing a controlled and limited but constant gas flow from one of said pressure chambers to a negative bounce chamber in one of said cylinders, a gas flow passageway between a source of different gas pressure generated by the operation of the compressor and control means arranged to variably control gas flow out of said bounce chamber in response to variations in the pressure in said source of different gas pressure.

4,705,461

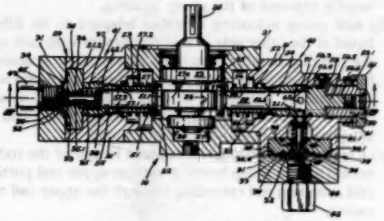
TWO-COMPONENT METERING PUMP

George W. Clements, Minnetonka, Minn., assignor to Seeger Corporation, St. Paul, Minn.

Continuation of Ser. No. 76,901, Sep. 19, 1979, abandoned. This application Jul. 29, 1981, Ser. No. 287,836

Int. Cl.[4] F04B *9/08*

U.S. Cl. 417—387 **6 Claims**



1. In a pump system of the type having a diaphragm pump including a pumpage chamber and a hydraulic fluid chamber separated by a diaphragm, having pump means operating said diaphragm pump and including cylinder means and piston means defining a pumping chamber in communication with said hydraulic fluid chamber, said piston means being reciprocated within said cylinder means by a drive, and having a reservoir for hydraulic fluid and a housing for at least some of the system components, the improvement wherein said cylinder means comprises: cylinder wall sleeve means extending into said reservoir and a threaded stem extending toward said housing, said cylinder wall sleeve means being selectively movable in the directions of reciprocation of said piston means; port means extending through said cylinder wall sleeve means between said pumping chamber and reservoir, the piston means reciprocating across the port means to alternatively open and close the port means; and further comprising rotary control means threaded into said housing and extending to the interior of the housing and into engagement with the treads of said threaded stem, the threads between the housing and the rotary control means having a pitch different from the threads between the stem and the rotary control means.

4,705,462

PROCESS AND DEVICE FOR IMPROVING WORKING OF LIQUID PUMPS

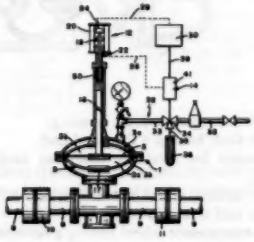
Claude Balembois, Rhode St. Genese, Belgium, assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Nov. 4, 1985, Ser. No. 795,017

Claims priority, application Belgium, Apr. 11, 1985, 0/214820

Int. Cl.[4] F04B *43/06*

U.S. Cl. 417—395 **1 Claim**



1. A pumping system for a spring assisted diaphragm pump having a pump housing, a diaphragm dividing the housing into a pumping chamber having means for pump discharge and for

pump intake, and a pump actuating chamber having an opening substantially concentric with the diaphragm, said actuating chamber adapted to receive a fluid pressure medium acting upon one side of the diaphragm to produce the pumping stroke and means for predetermining the distance of the pumping stroke comprising,

(a) an actuating rod extending from said diaphragm through said pump actuating chamber opening in said pump housing with a major portion of the length of said rod outwardly exposed of the pump housing,

(b) said pump actuating chamber adapted to be filled by liquid at the other side of said diaphragm with said actuating rod displaceable between a first extreme position in a first direction within said pump housing when said actuating chamber is filled with said liquid and to a second extreme position in an opposite direction when said actuating chamber is emptied of said liquid,

(c) a casing surrounding the exposed length of the rod connected to said pump housing with an upper end portion of said actuating rod extending through the upper end of said casing,

(d) stroke detecting means located at said exposed portion of said actuating rod including sensing means comprising a bottom sensor for detecting said first extreme position of said actuating rod and a top sensor for detecting the other extreme position of said actuating rod,

(e) actuating means interconnected with said sensing means for receiving a signal for said sensing means controlling movement of said actuating rod and interconnected pump diaphragm, and

(f) a timer connected to the sensing means adapted to set a predetermined cycle time for authorizing operation of said actuating means for the emptying and filling said pump actuating chamber,

(g) said actuating means comprising an electromagnetic device operable to open and close a valve member to a source of compressed air to said pump actuating chamber.

4,705,463

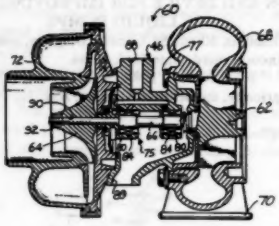
COMPRESSOR WHEEL ASSEMBLY FOR TURBOCHARGERS

Fidel M. Joco, Long Beach, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Continuation of Ser. No. 487,144, Apr. 21, 1983, abandoned. This application Jun. 6, 1986, Ser. No. 873,265

Int. Cl.[4] F16D *1/00*

U.S. Cl. 417—407 **20 Claims**



9. In a turbocharger having a housing:

a rotatable shaft having a threaded end;

bearing means for rotatably mounting said shaft to said housing;

a boreless turbine wheel secured to an end of said shaft opposite said threaded end;

a boreless compressor wheel having a boreless hub supporting a circumferentially arranged array of impeller blades; and

an attachment member mounted on said hub generally at one axial end thereof in a position generally centered on a central axis of said hub, said attachment member including means for attachment to said threaded end of the shaft.

4,705,464

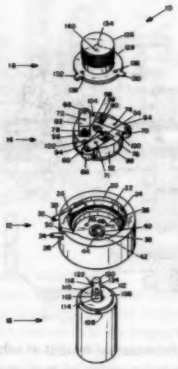
MEDICINE PUMP

Timothy V. Arimond, St. Louis Park, Minn., assignor to Surgidev Corporation, Goleta, Calif.

Filed May 9, 1986, Ser. No. 861,366

Int. Cl.[4] F04B *43/12*

U.S. Cl. 417—477 **1 Claim**



1. Drug dispensing pump comprising:

a. low power DC sealed motor with torqued gear ratio means;

b. pump head including a plurality of plungers connected to a shaft of said motor, each of said plungers supporting a roller bearing, each of said plungers spring loaded for accommodating variances of pump tubing, and each of said springs including a spring constant to fully occlude said pump tubing, each of said plungers mounted at an angle in said pump head for minimized friction, as well as low power at high infusion rates;

c. pump housing secured to a motor housing including a recessed slot for keeping said pump tubing in said pump head captured and providing a guide for said roller bearings; and,

d. means for loading said pump tubing into said pump housing, said loading means including a disc affixed to said shaft, at least three fingers extending outwardly from said disc, and a knurled knob attached to said disc for manually rotating said shaft providing movement of said fingers whereby said loading means loads pump tubing into said pump head.

4,705,465

OIL-PRESSURE TRANSMISSION DEVICE

Ming H. Su, 21-1, Txy Chih North 1 Rd., Fenq Shan City, Kaohsiung Hsien, Taiwan

Filed Jan. 22, 1986, Ser. No. 820,992

Int. Cl.[4] F01C *21/16, 15/04*

U.S. Cl. 418—23 **13 Claims**

1. A fluid pressure transmission device comprising:

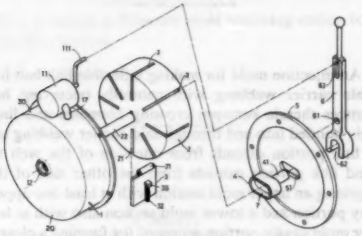
a cup-shaped main housing member having a base portion and a cylindrical wall portion having a cylindrical internal surface, said base and wall portion forming a rotor chamber;

a rotor rotatably mounted within said rotor chamber on an axis of rotation;

an annular chamber between said rotor and said internal surface of said wall;

an interior cam chamber in said rotor;

a plurality of radial slots in said rotor extending between said cam chamber and the outer periphery of said rotor;
a plurality of radial vanes slidably mounted in said radial slots;
a cover plate attached to said main housing member to close said cam chamber and sealingly close said annular chamber;
an elongated slot through said cover plate;
a cam rod extending through said elongated slot in said cover plate and having an outer extension projecting from the outer surface of said cover plate;
a non-rotatable cam member within said cam chamber and connected to the inner end of said cam rod;
a substantially elliptical outer cam surface on said cam member for displacing said vanes radially and into and out of said annular chamber;
roller cam followers on the radial inner ends of said radial vanes;
means to resiliently urge said radial vanes radially inwardly to retain said followers in engagement with said cam surface;
a control arm pivotally mounted on said cover plate and



having an inner part rotatably engageable with said outer extension of said cam rod and an outer part;
an elongated recess in said outer part;
a fluid pressure control valve mounted on said main housing member;
a rotatable valve control lever on said valve having an outer end engageable in said elongated recess;
a partition extending inwardly from said internal surface of said housing cylindrical wall having an inner portion engaging the outer periphery of said rotor to divide said chamber into inlet and outlet portions;
inlet and outlet conduit means connecting said valve with said annular chamber on opposite sides of and adjacent to said partition; and
pivot means having a pivot axis for pivotally mounting said control arm on said cover plate, so that rotation of said control arm about said pivot axis simultaneously displaces said cam rod in said elongated slot and said cam member therewith in said cam chamber and said valve control lever, so that fluid pressure from said valve flows through said annular chamber to selectively drive said rotor via said vanes in either direction depending on the position of said control arm.

4,705,466

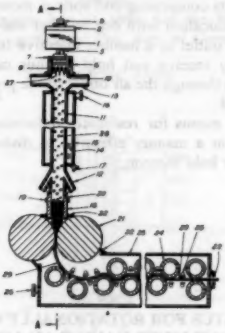
METHOD AND APPARATUS FOR PRODUCING ROLLED PRODUCT FROM METAL DROPLETS

Oscar Balassa, 38 Dettman Avenue, Longueville 2066, Australia

Continuation-in-part of Ser. No. 626,873, Jun. 21, 1984. This application Dec. 16, 1985, Ser. No. 809,565
Int. Cl.[4] B22F *3/18*
U.S. Cl. 425—6 **14 Claims**

1. A method of continuously processing metal including the production of at least partially solidified metal droplets suitable for direct rolling into a rolled product, said method comprising the steps of passing molten metal through a trough having a perforated bottom to form streams of substantially uniform droplets in a cooling tower under said trough, retarding the downward flow of said droplets to a substantially constant velocity and cooling said droplets principally by radiation in a cooling tower containing inert gas.

7. Apparatus for continuously processing metal including the production of at least partially solidified droplets ready for direct rolling into rolled product, said apparatus comprising a



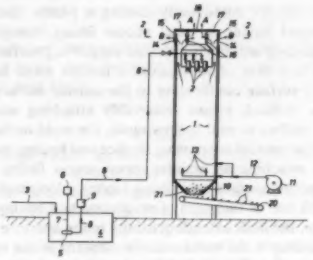
trough for receiving molten metal, said trough having a perforated bottom to permit passage of the molten metal therethrough to form streams of droplets, a cooling tower under said trough through which said droplets fall, and means for retarding the downward flow of said droplets to a substantially constant velocity, whereby said droplets are cooled principally be radiation.

4,705,467

METHOD AND APPARATUS FOR FILTERING THE AIR OUTLET OF A SOLID SULPHUR PARTICLE PRODUCTION APPARATUS

Johannes Bakker, Calgary, Canada, assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 19, 1985, Ser. No. 799,681
Claims priority, application Canada, Nov. 28, 1984, 468768
Int. Cl.[4] B29B *9/00*
U.S. Cl. 425—7 **6 Claims**



1. A production apparatus for producing solid sulphur particles from molten sulphur supplied to the production apparatus, said production apparatus comprising:
a hollow column;
sulphur spray means in the upper part of the column;
sulphur supply means connected to the sulphur spray means;
an air inlet in the lower part of the column;
air supply means connected to the air inlet;

a collecting device in the lower part of the column for collecting the solid sulphur particles so produced;

discharge means for removing the solid sulphur particles produced from the column;

an air outlet in the upperpart of the column; and

a filter screen apparatus covering said air outlet, said filter screen apparatus comprising:

a plurality of closely spaced resiliently deformable filter elements comprising coil springs mounted in vibration communication with one another and arranged across the air outlet in a manner effective to collectively releasably receive and hold sulphur carried in the air passing through the air outlet of the production apparatus; and

vibrating means for resiliently deforming the filter elements in a manner effective to dislodge and release sulphur held thereon.

4,705,468

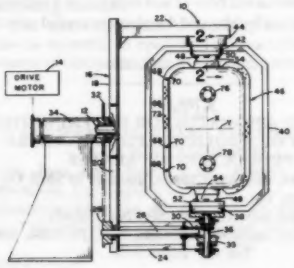
APPARATUS FOR ROTATIONALLY CASTING A PLASTIC TANK LINER HAVING AN ACCESS FITTING

Edward T. LeBreton, Mentor, Ohio, assignor to Essef Corporation, Chardon, Ohio

Filed Nov. 18, 1985, Ser. No. 799,331

Int. Cl.[4] B29C *41/04*

U.S. Cl. 425—116 **12 Claims**



1. Apparatus for rotationally casting a plastic liner for a pressure vessel having a metal access fitting, comprising a rotational casting arm having a mold supporting surface rotatable about two axes of revolution, a hollow mold having a mold cavity surface conforming to the outside surface of the liner to be molded, means removably attaching said mold supporting surface to said hollow mold, the mold including an aperture adjacent said supporting surface and having means for removably attaching an annular metal access fitting to said mold supporting surface said fitting having a longitudinal axis aligned with one of said axes of revolution and having a neck and a flange, the neck extending axially in the aperture and the flange extending in the mold radially outward of the neck, the flange being of sufficient radial extent beyond the neck to provide a peripheral area adapted to be constrained by resin impregnated wound filaments and the neck being of sufficient axial length beyond the flange to at least extend through the thickness of the filament winding, the fitting having at least a first surface portion extending into said mold cavity, said first surface portion together with the surface of the mold cavity cooperating to form the shape of the liner and being coatable with molding composition the access fitting and liner forming a permanent assembly upon casting of the liner.

4,705,469

APPARATUS FOR MAKING A FLEXIBLE LINK BELT

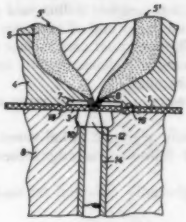
Rudolf Liebi, Altstaetten, and Ernst Bosshard, Adliswil, both of Switzerland, assignors to EgoKiefer AG, Alstaetten, Switzerland

Filed Nov. 4, 1986, Ser. No. 926,978

Claims priority, application Switzerland, Nov. 6, 1985, 4767/85; Sep. 23, 1986, 3813/86

Int. Cl.[4] B29C *45/14, 45/40*

U.S. Cl. 425—117 **7 Claims**



1. An injection mold for making a flexible link belt having a flexible carrier webbing with naturally occurring holes or interstices therein between crossing filaments and links intimately bonded into and through said carrier webbing so that a first link portion extends from one side of the web while a second link portion extends from the other side of the web comprising an upper mold section with at least one upper mold cavity portion and a lower mold section also with at least one lower mold cavity portion arranged for forming a closed mold cavity when the mold sections are closed, means on the sections for holding said flexible carrier webbing between said upper and lower mold sections so that said flexible carrier webbing passes through said mold cavity, injection nozzle means extending into one of said cavity portions for directly filling said one cavity portion and for filling the other cavity portion through said holes in said flexible carrier webbing, and core means movably arranged and extending into the other of said cavity portions substantially opposite said injection nozzle means for supporting said webbing against an injection molding pressure, said core means being movable substantially perpendicularly to said carrier webbing.

4,705,470

CHEESE HANDLING APPARATUS

Angelo D. Penta, 29 Timberlea Trail, Kirkland, Quebec, Canada H9J 2Y3

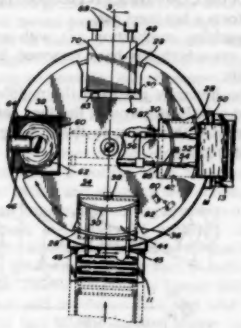
Filed Feb. 27, 1985, Ser. No. 706,466

Int. Cl.[4] A23P *1/10*; B29C *33/34, 39/34, 43/58*

U.S. Cl. 425—148 **5 Claims**

1. An apparatus for handling cheese comprising a frame including a platform, a turntable mounted on said frame above said platform, means for driving the turntable relative to the platform, the turntable having a plurality of mold recesses, the mold recesses of the turntable being registerable with stations on the platform, the stations on the platform including in sequence a mold receiving station, a filling and weighing station, a compacting station, and an unloading station, the mold recesses on the turntable registerable with the stations being equally spaced-apart, cut-outs on the periphery about the turntable, the platform includes mold runner means enabling the mold to slide thereon with the minimum of friction, the weighing station including scale means on the platform associated with the runner means for weighing mold at the filling and weighing station, the drive means being adapted to drive the turntable

intermitently while advancing the mold recesses and thus the molds over the runner means on the platform from one station



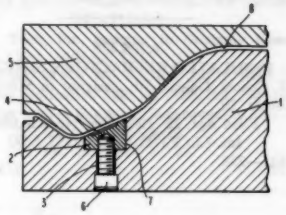
to the other in sequence from the mold receiving station to the mold unloading station.

4,705,471

MOLD FOR PRODUCING A PLATE

Ashwin N. Shah, Fairport, and Roland DeMay, Newark, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 2, 1985, Ser. No. 761,951
Int. Cl.[4] B29C *33/42, 43/46*
U.S. Cl. 425—195 **6 Claims**



1. A mold for use in thermoforming thermoplastic sheet material into the shape of a circular plate comprising:

(a) a dual-section mold body having corresponding male and female members which define a cavity in the shape of a circular plate when in the closed position the female member having a substantially flat circular base, an outwardly sloping annular rim and having an interior profile which in sequence from the junction of said rim and said base, has a concave segment, a first convex segment, and a second flat segment which defines the outer edge of said rim; said male member having an annular shaped recess formed therein in a portion of said member corresponding to the first flat segment of the female member;

(b) a removable ring-shaped insert positionable within the recess to provide a surface of the male member partially defining the mold cavity; and

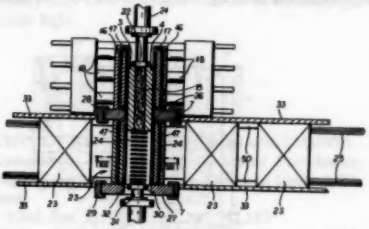
(c) means for securing said insert within the recess, said means being such as to permit removal and replacement of the insert.

4,705,472

DEVICE FOR COMPRESSION MOLDING OF SECTIONS WITH A CONSTANT CROSS-SECTION CONSISTING OF VEGETABLE PARTICLES

Anton Heggenstaller, Mühlenstr. 9, 8891 Unterbernbach, Fed. Rep. of Germany

Division of Ser. No. 673,755, filed as PCT EP84/00040, Feb. 20, 1984, published as WO 84/03472, Sep. 13, 1984, Pat. No. 4,649,006.
This application Aug. 14, 1986, Ser. No. 896,948
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3307557
Int. Cl.[4] B29C *71/02*
U.S. Cl. 425—261 **12 Claims**



1. An apparatus for the compression molding of an elongate body from particles of vegetable matter and a thermally curable binder, said apparatus comprising:

means for metering a mixture of said particles and said binder into a chamber to form an elongate blank;

a first plurality of molding jaws at a pressing station for subjecting said blank to compression between them, said first plurality of molding jaws engaging said elongate blank over its entire length and completely enclosing the periphery of said blank to impart a final shape to said blank conforming to the intended shape of the compression-molded body;

means for transferring the first plurality of molding jaws and the blank compressed thereby as a unit and without relaxation of compression force to a curing station at a location spaced from the location of said pressing station so that another blank can be subjected at said pressing station to compression by another plurality of molding jaws advanced to said pressing station;

means for curing the blank at said curing station within the confines of said first plurality of molding jaws and under the pressing forces thereof to transform said blank at said curing station to a corresponding compression-molded body; and

means for separating the molding jaws of said first plurality to release the compression-molded body transformed from said blank.

4,705,473

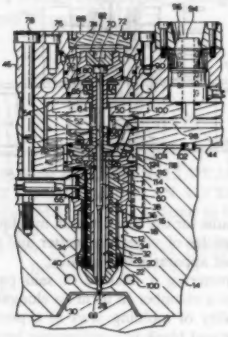
DUAL FEED BUSHING FOR MULTI-CAVITY INJECTION MOLDING

Harald H. Schmidt, Georgetown, Canada, assignor to Mold-Masters Limited, Georgetown, Canada

Filed Nov. 5, 1986, Ser. No. 927,068
Claims priority, application Canada, Oct. 30, 1986, 521873
Int. Cl.[4] B29C *45/22*
U.S. Cl. 425—549 **3 Claims**

1. In a multi-cavity valve gated injection molding system comprising a manifold extending between a mold back plate and a plurality of spaced heated nozzles seated in a cavity plate, an elongated valve pin having a driven end and a tip end mounted in a central bore in each nozzle, the driven end of the valve pin being operatively connected to valve pin actuating mechanism mounted in the mold back plate whereby the valve pin is reciprocated between a retracted open position and a closed position wherein the tip end of the valve pin is seated in

a gate extending through the cavity plate to a cavity, and a melt passage which branches from a common inlet and extends through the manifold connecting to the transverse bore and around the valve pin in the central bore of each nozzle to convey pressurized melt from a matching machine to each gate, the improvement wherein; the melt passage extends through a valve pin bushing having a main body portion located between the manifold and each heated nozzle, the main body portion of each bushing being fixed to the respective nozzle and having first and second opposed surfaces and an outer periphery, a portion of the first surface abutting against the manifold, at least a portion of the second surface abutting against the respective nozzle and a sufficient portion of the outer periphery abutting the surrounding cavity plate to laterally locate the bushing, the main body portion having a valve



pin bore extending therethrough from the first surface to the second surface, the valve pin bore having a first portion extending from the first surface and a second aligned portion extending from the second surface to join the first portion, the first portion of the valve pin bore having a substantially uniform diameter to snugly receive the valve pin therethrough, the second portion of the valve pin bore having a larger diameter than the first portion and extending in alignment to connect to the central bore of the nozzle, the main body portion of the valve pin bushing having a melt duct which forms a portion of the melt passage, the melt duct extending from the first surface of the main body portion to a join between the first and second portions of the valve pin bore, the melt duct branching into two arms with bends which are smoothly curved to connect to the valve pin bore on opposite sides thereof.

4,705,474

METHOD AND APPARATUS FOR BATCH PREPARATION AND FEEDING INTO THE SMELTING PROCESS

Matti E. Honkaniemi; Lauri A. Mustikka; Martti J. Jankkila; Pentti O. Hokkanen, all of Tornio, Finland; Risto M. Heikkilä , Haparanda, Sweden, and Launo L. Lilja, Pori, Finland, assignors to Outokumpu Oy, Helsinki, Finland

Division of Ser. No. 745,710, Jun. 17, 1985, abandoned. This application Jul. 28, 1986, Ser. No. 890,097

Claims priority, application Finland, Jun. 27, 1984, 842577

Int. Cl.[4] F27B *15/00*; **F27D** *7/00*

U.S. Cl. 432—14 **18 Claims**

1. A method for preparing a feed mixture to be fed into a smelting furnace at one stage, including the step of:

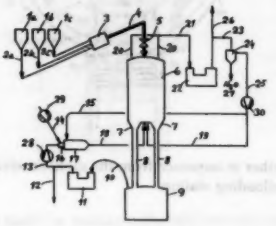
conducting a feed mixture which is mixed in correct proportions and homogenized by means of a suitable distribution device into the upper part of a pre-treatment silo onto the surface of a feed mixture bed contained in said silo;

settling down the feed mixture bed first in a uniform flow and then dividing the uniform flow into several sub-flows which are caused to converge in roughly conical form and finally to continue as cylindrical feed flows onto the surface of a bed located in the smelting furnace placed below the pre-treatment silo;

burning part of the CO-bearing gas produced in the smelting furnace to form a hot inert gas;

mixing the resulting combustion gas with an amount of circulating gas which has been removed from the pre-treatment silo;

conducting the hot inert gas from the middle of the feed mixture bed sub-flows through the feed mixture bed in countercurrent with respect to the flowing direction of the feed mixture;



conducting said gas flow to a conically convergent region of the sub-flows at such a spped that even partial fluidization of the feed mixture is prevented and the gas is made to rise through the feed mixture bed; and

feeding the major part of the hot inert gas at the bottom part of the conically covergent region of the sub-flows;

feeding the rest of the gas at a spot which is located above the main feed opening but still within the conically convergent region of the sub-flows;

recovering the gas at an upper part of the pre-treatment silo; and

subsequently scrubbing and drying the gas removed from the pre-treatment silo in order to achieve a desired volume and temperature for the inert gas.

4,705,475

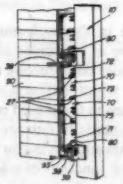
INSULATED REFRACTORY SHIELD

Stephen J. Coates, Galena, Ill., assignor to Merkle Engineers, Inc., Galena, Ill.

Filed Apr. 25, 1986, Ser. No. 856,039

Int. Cl.[4] F27D *1/12*; **F23M** *5/00*

U.S. Cl. 432—238 **13 Claims**



1. In a refractory shield for a high temperature furnace comprising: a hollow hanger tube depending from a support beam and having one flat face with a plurality of longitudinally arranged oblong openings spaced to receive one end of metallic hanger means having an opposite end to engage and hold refractory brick forming a part of said refractory shield wherein at least one shelf metallic hanger means is spaced between a plurality Y-shaped tie-back metallic hanger means,

said opposite end of said tie-back metallic hanger means having extending legs engaging and holding said refractory bricks, said oblong openings receiving said hanger means having a cross-sectional area greater than the cross-sectional area of said metallic hanger means passing therethrough to allow cooling fluid introduced at one end of said hollow hanger tube and flowing the length to said tube to pass outwardly at said oblong openings cooling said metallic hanger means, the improvement comprising: a plurality of rigid insulation units between said refractory shield and said hanger tube contacting the exterior surface of said refractory brick, each said insulation unit having a height of two courses of said refractory bricks and having oblong cutouts along a bottom edge to accommodate said metallic hanger means and allowing said cooling fluid to flow from said hollow hanger tube oblong openings over said metallic hanger means; a plurality of generally channel-shaped wedges having extending legs joined by a flat side wall, at least one said wedge between an exterior face of each said insulation unit and said flat face of said hollow hanger tube, said extending legs against said insulation unit and said flat side wall against said flat face of said hollow hanger tube forcing an interior face of said insulation unit into said contact with said exterior surface of said refractory brick; and a support clip positioned between said extending legs of a first said tie-back metallic hanger means immediately above said shelf metallic hanger means, said support clip having a flat upper side for supporting the top of said oblong cutout of said insulation units by resting thereon, and having an inner side resting adjacent the exterior face of said refractory brick and a shorter outer side cut in its central portion to form flaps which are bent inwardly to provide support for said upper side, the lower edges of the end regions of said outer side resting on the upper surface of said tie-back metallic hanger means providing support for the first course of each insulation unit above each said shelf metallic hanger means and providing an opening for flow of cooling fluid from said hollow tube over said shelf metallic hanger means and said first tie-back metallic hanger means immediately thereabove.

4,705,476
METHOD AND APPARATUS TO I RODUCE ARTIFICIAL DENTURES

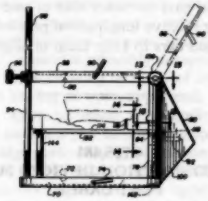
John J. Blair, York, Pa., assignor to Dentsply Research & Development Corp., Milford, Del.

Continuation-in-part of Ser. No. 510,404, Jul. 1, 1983, Pat. No. 4,551,098. This application Feb. 19, 1985, Ser. No. 702,816

The portion of the term of this patent subsequent to Nov. 5, 2002, has been disclaimed.

Int. Cl.[4] A61C *13/22*

U.S. Cl. 433—171 **14 Claims**



1. A method of forming a denture having a plurality of artificial teeth comprising the steps of:

(a) using negative impressions of at least a portion of a jaw of a patient having at least one edentulous portion to make therefrom a model of said jaw portion;

(b) applying to the model actinic light curable, moldable, denture base material to conform the same to the edentuluous portion of the model;

(c) exposing the denture base material to actinic light for a time sufficient to harden said material to form a denture base;

(d) movably affixing a plurality of artificial teeth to the denture base by applying to at least one of the denture base and the teeth an additional quantity of actinic light curable, moldable, denture base material and contacting said denture base with said teeth;

(e) irreversibly affixing the teeth to the denture base by exposing minor proportions of the added actinic light curable material to actinic light for a time sufficient to cure said minor portions, said irreversible affixation being insufficient to cure a major proportion of the added material, and

(f) substantially fully hardening said material by irradiating it with actinic light.

4,705,477
SIMULATION OF AERIAL DECOY ARRANGEMENTS

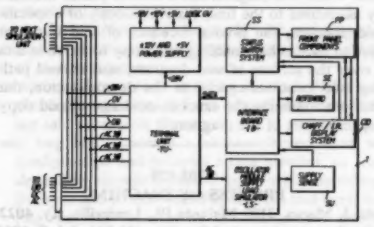
Robert B. Komorowski, Fareham, and Mark Else, Portchester, both of England, assignors to Plessey Overseas Limited, Ilford, England

Filed Jun. 21, 1985, Ser. No. 747,183

Claims priority, application United Kingdom, Jun. 23, 1984, 8416083

Int. Cl.[4] G06G *7/80*; F41F *27/00*

U.S. Cl. 434—24 **3 Claims**



1. A launching barrel/oscillator module simulation unit for simulating a plurality of launcher barrels and associated oscillator module of an aerial decoy arrangement, said launching barrel/oscillator module simulation unit when in use being connected to a launcher control module of aerial decoy arrangement which sends command information over a data link for the operation of said launcher barrel/oscillator module simulation unit in accordance with specific decoy requirements, said launching barrel/oscillator module simulation unit comprising:

means for sending status information back to the launcher control module over said data link;

a plurality of switches in respect of each simulated launcher barrel and operable in dependence upon conditions of loaded and unloaded of the simulated launcher barrel to be simulated;

selector switching means for the selective application of simulated pulses of firing, charge and timing pulses to the appropriate simulated launcher barrels;

a plurality of digital display indicators appertaining to the appropriate simulated launcher barrels and effective for displaying predetermined time intervals corresponding to simulated timing pulses and;

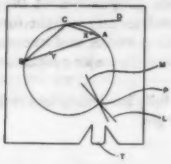
further switching means for simulating conditions of misfire of the launcher barrel/oscillator module and various indicator lamps for providing visual indications relating to pre-set and monitoring functions.

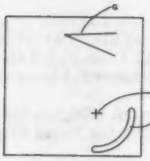
4,705,478

SUPERIMPOSED TRANSPARENCIES USED IN EDUCATION

Reza Djali, 177, Mount Pleasant, Kingswinford, West Midlands DY6 9SS, England

Filed Mar. 22, 1985, Ser. No. 714,968
Int. Cl.[4] G09B *23/04*
U.S. Cl. 434—215 10 Claims





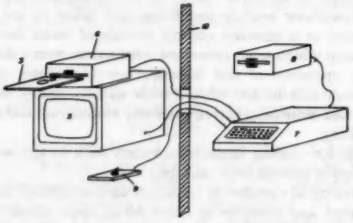
1. A device for animated demonstrations wherein a planar member features a diagram and a second planar member, pivotally assembled to the first, features a copy of a specific part of said diagram; the pivotal freedom of said two members relative to each other enabling said copy to move in a curved path over the surface of said diagram; said curved path containing two locations crucial to the demonstration; one said crucial location being the exact coincidence of said copy with said specific part of the diagram.

4,705,479

PROCESS OF TEACHING

Melvin J. Maron, 3100 Myiania Pl., Louisville, Ky. 40220

Continuation-in-part of Ser. No. 629,241, Jul. 9, 1984, abandoned. This application Mar. 27, 1986, Ser. No. 844,800
Int. Cl.[4] G09B *5/06*
U.S. Cl. 434—335 12 Claims



1. A system for grading answers to a set of problem statements submitted to a group of students, each problem statement including selectable alphanumeric parameters, each parameter representing a number to be selected from one of a plurality of unique identification codes, each code comprising a plurality of numerals in a predetermined order, including;

a. a transportable preprogrammed student memory means which requests and stores a unique identification code as well as information from the student comprising answers to problem statements;

b. grading means, including receptacle means to read student memory means in order to receive said unique identification code, determine the correct answers in accordance with said unique identification code and use the correct answers to grade the submitted answers, store the results on one or more electronic memory means, and report results;

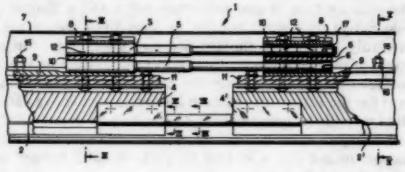
c. grading apparatus, wherein said receptacle means receives said student memory device, reads said identification code and answer information from said student memory device, determines the correct answers in accordance with said unique identification code, and uses said correct answers to grade the submitted answers.

4,705,480

ELECTRICAL CONNECTION DEVICE FOR A CONDUCTIVE BUSBAR COMPONENT INCLUDING AN EXPANSION JOINT

Max Dumontet, Pantin, and Yves Pelletier, Cergy, both of France, assignors to Delachaux S.A., Gennevilliers, France

Filed Mar. 11, 1986, Ser. No. 838,740
Claims priority, application France, Mar. 11, 1985, 85 03526
Int. Cl.[4] H01R *41/00*
U.S. Cl. 439—33 12 Claims



1. An electrical connection device for a conductive busbar component including an expansion joint, said busbar component comprising rigid bars presenting a pickup shoe with a conductive path for mechanical guidance and electrical pickup, said expansion joint being constituted by the free ends of two adjacent bars coming into interfitting with each other in such a manner as to ensure continuity in guidance and in electrical pickup, said electrical connection device being further constituted by a sliding system comprising at least one conductive pin fixed on one of said bars and at least one associated pluggable connector fixed on the other one of said rigid bars, said sliding system simultaneously providing electrical continuity between said bars on either side of said expansion joint regardless of their relative longitudinal position, and mechanical guidance of said bars to keep them in alignment.

4,705,481

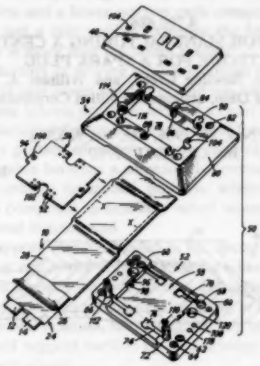
ELECTRICAL CONNECTION DEVICES FOR USE WITH FLAT CABLE

Philip N. W. Pritchard, Whitstable, England, assignor to Amphenol Corporation, Wallingford, Conn.

Filed Sep. 19, 1985, Ser. No. 777,397
Claims priority, application United Kingdom, Sep. 26, 1984, 8424281
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—417 14 Claims

1. A connection device for a flat cable, comprising a base member having a cable-receiving surface over which a flat cable is to be laid, an upper member for location over the cable-receiving surface of the base member, securing means for

securing the upper and base members together, and an insulative separating plate for location between the upper and base



members over the cable-receiving surface to pass transversely through a cable to separate conductive elements thereof.

4,705,482

TERMINAL CONNECTOR ASSEMBLY FOR MULTICONDUCTOR CABLE

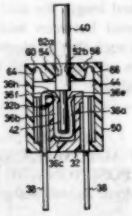
Seiji Endo, and Eiji Kikuchi, both of Tochigi, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 6, 1986, Ser. No. 816,618

Claims priority, application Japan, Jan. 11, 1985, 60-2604[U]; Jan. 14, 1985, 60-4483

Int. Cl.[4] H01R *9/07, 13/58*

U.S. Cl. 439—460 **10 Claims**



1. A terminal connector assembly for removably receiving end portions of a multiconductor cable thereby to establish electrical communication between said cable and a substrate member, said connector assembly comprising:

a terminal block defining an array of interior elongate cavities each having an open upper end,

each said cavity including a generally U-shaped terminal member having a pair of opposing spaced-apart side arms and a bridge portion integrally connecting said pair of side arms, said bridge portion being located near a lower end of said cavity opposite to said upper end such that said pair of side arms extend upwardly to said open upper end to permit a respective one of said cable end portions to be insertably received between said pair of arms,

said pair of arms integrally including an opposing pair of inwardly protruding contact portions which establish therebetween an entranceway of reduced cross-sectional dimension, said contact portions for contacting said end portion when said end portion is inserted between said pair of side arms thereby to establish electrical contact therewith;

said connector assembly also comprising a tail member electrically connected to one of said side arms and extending along and below an exterior side of said terminal block for connection to said substrate whereby electrical communication between said terminal end portion and said substrate is established.

4,705,483

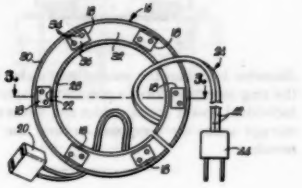
TREE LIGHT WIRING HARNESS

William R. Davis, 9801 Mission Rd., Overland Park, Kans. 66206, and Lawrence E. Davis, 10431 Barton, Overland Park, Kans. 66214

Filed Dec. 29, 1986, Ser. No. 946,765

Int. Cl.[4] H01R *11/00*

U.S. Cl. 439—502 **4 Claims**



1. A wiring harness for providing electrical power from a source thereof to an electrical load, said wiring harness comprising:

a flexible, resilient, C-shaped ring body;

an electrical receptacle;

means for coupling said receptacle with said ring body; and

means for electrically coupling said receptacle with a source of electrical power;

wherein said receptacle coupling means includes a receptacle-receiving cavity defined in said ring body for receiving said receptacle therein;

said ring body presents a channel-shaped cross sectional configuration and includes a ring member, an inner wall depending therefrom, and a outer wall depending therefrom parallel to and spaced apart from said inner wall, said ring member includes an interior surface disposed between said inner wall and said outer wall, said interior surface includes said cavity;

said harness includes a plurality of said receptacles and a corresponding plurality of said cavities;

wherein said electrical coupling means includes an electrical plug adapted for electrically coupling with a source of electrical power and includes a pair of conductors electrically coupled with said plug and said receptacles.

4,705,484

POWER CORD, WIRE AND CABLE CONTAINER

Lawrence Lerner, Beverly Hills, and Stephen P. Diskin, Los Angeles, both of Calif., assignors to MEGA/ERG Inc., Beverly Hills, Calif.

Filed Oct. 9, 1986, Ser. No. 916,864

Int. Cl.[4] H01R *13/60*

U.S. Cl. 439—502 **6 Claims**

1. A power cord, cable and wire container including,

a base member,

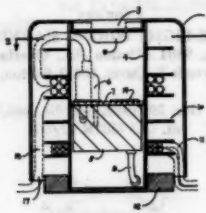
a first cylindrical member having a first particular diameter coupled to and extending outwardly from the base member,

a second cylindrical member having a second particular diameter greater than the first cylindrical member and having a closed end and an open end,

the second cylindrical member forming a removable protective cover by coaxially overlaying the first cylindrical member with the open end adjacent to and spaced from the base and the closed end resting on the first cylindrical

member to form a storage space between the first and second cylindrical members, and

a plurality of ring members located within the storage space and with each ring member having an inner diameter greater than the first particular diameter and an outer



diameter less than the second particular diameter so that the ring members form a plurality of spacers to segragate individual power cords, cables and wires stored within the storage space by wrapping around the first cylindrical member.

4,705,485

ELECTRICAL JACK-PLUG

Jorgen Hansen, No. 44 Webersgade, DK-2100 Copenhagen 0, Denmark

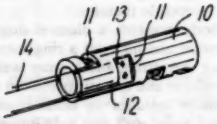
PCT No. PCT/DK85/00019, § 371 Date Oct. 9, 1985, § 102(e) Date Oct. 9, 1985, PCT Pub. No. WO85/04053, PCT Pub. Date Sep. 12, 1985

PCT Filed Feb. 27, 1985, Ser. No. 796,617

Claims priority, application Denmark, Feb. 28, 1984, 1186/84

Int. Cl.[4] H01R *17/18*

U.S. Cl. 439—669 **3 Claims**



1. An electrical jack-type connector, mainly for low voltage purposes, comprising a rod-shaped male part (1) having terminals in the form of conducting, axially displaced contact rings (2) and a matching tubular female part (7) having axially and peripherally displaced inner teminals to form contact with the contact rings (2) of the male part, which female part (7) comprises an outer tube (9) and an inner tube (10) fitted therein, which is formed with slots for the arrangement of the terminals of the female part (7), each being in connection with a respective conductor located between the inner tube (10) and the outer tube (9) for connection with cable conductors within a closed end of the outer tube (10), characterized in that the inner tube (10) is formed for tight insertion into the outer tube (9) and has substantially rectangular slots (11) formed in its tube wall, each of said slots communicating with a comparatively narrow track (12) extending on the external side of said tube wall parallel to the tube axis from the slot to an orifice at one end of the inner tube (10), and that the terminals of the female part comprise contact flaps (13), each formed of a single flat rectangular planar surface having opposed edges abutting the inner wall of the outer tube each formed integrally with its respective conductor (14) for loose arrangement into its respective slot and the track (12) communicating therewith prior to the insertion of the inner tube (10) into the outer tube (9), the conductors being of such length as to, on the insertion of the inner tube (10) into the outer tube (9), be led through an aperture at one end of the outer tube (9), which aperture is closed by a cap (8) after connection of said respective conductors (14) with the cable conductors.

4,705,486

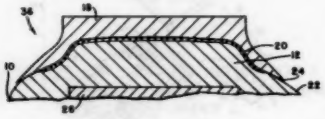
METHOD FOR MANUFACTURING A CENTER ELECTRODE FOR A SPARK PLUG

Martin G. Myers, Bowling Green, and William A. Barrett, Bradner, both of Ohio, assignors to Allied Corporation, Morristown, N.J.

Filed Nov. 24, 1986, Ser. No. 934,512

Int. Cl.[4] H01T *21/02*

U.S. Cl. 445—17 **11 Claims**



1. A method of manufacturing an electrode for a spark plug comprising the steps of:

cutting a piece of inconel wire from a source to define a cylindrical blank member having a first end and a second end;

extruding said cylindrical blank to define a central opening that extends from said second end toward said first end;

welding a strip of platinum to said first end;

chamfering said first end to remove any platinum and weld flash that may have been produced during said welding;

forming an extruded tip that extends from said first end such that platinum extends along the chamfered surface to completely cover said weld;

inserting a copper member into said central opening; and

further extruding said cylindrical blank and copper member to define a finished length for said electrode, establishing a mechanical bond between said copper member and cylindrical blank such that an electrical conductive path is producd between said tip through said blank member into said copper member.

4,705,487

MOVABLE TOY AUTOMATICALLY SWINGABLE BETWEEN AN UP POSITION AND A DOWN POSITION

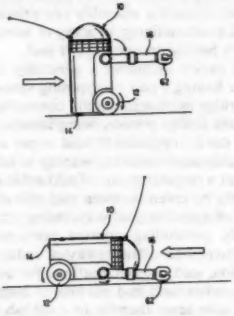
Zenichi Ishimoto, Tokyo, Japan, assignor to Nikko Co., Ltd., Tokyo, Japan

Filed Sep. 3, 1985, Ser. No. 771,651

Claims priority, application Japan, Jan. 16, 1985, 60-4087

Int. Cl.[4] A63H *11/10, 17/00, 30/04*

U.S. Cl. 446—290 **10 Claims**



1. A robot toy movable on a support surface and capable of

automatically swinging between an up position and a down position, said toy comprising:

(a) a vertically elongated toy body comprising an upper portion and a lower portion each comprising a front section and a rear section, wherein the height of said toy body is more than the width thereof;

(b) a plurality of driving wheels mounted on said front section of said lower portion of said toy body such that said driving wheels protrude beyond a front face of said toy;

(c) a plurality of arms mounted on said front section of said upper portion of said toy body, each of said arms being swingable between a substantialy vertical position and a substantially horizontal position, wherein each of said arms comprises an auxiliary wheel mounted adjacent the free end thereof; and

(d) a support wheel mounted in the center of said rear section of said lower portion, wherein when said toy is positioned on said support surface and moves forwardly in said up position with said arms being in said substantially horizontal position, said elongated toy body is supported on said support surface by said driving wheels and said support wheel,

wherein when said toy is positioned on said support surface and moves rearwardly in said down position with said arms being substantially horizontal to said support surface, said elongated toy body is supported on said support surface by said driving wheels and said auxiliary wheel of each of said arms.

4,705,488

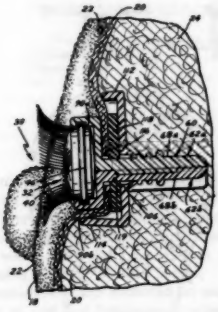
EYE ASSEMBLY FOR TOY DOLLS

Walter L. Bohl, Jr., and Michael E. Belfor, both of Cincinnati, Ohio, assignors to Kenner Parker Toys Inc., Beverly, Mass.

Filed Sep. 16, 1985, Ser. No. 776,722

Int. Cl.[4] A63H *3/38*

U.S. Cl. 446—393 **6 Claims**



3. In an eye assembly for dolls, an eyeball unit including a lens having a rib extending about at least a peripheral portion thereof, a socket unit including a flange having a peripheral portion corresponding in shape to the peripheral portion of said lens and having a groove formed therein, said socket unit being comprised of first and second stems, said flange portion being integral with said first stem, and said second stem having a flange portion corresponding in shape to another peripheral portion of said lens and having a groove therein, whereby reception of said rib in said grooves retains said eyeball unit engaged with said socket unit, the portion of said flange integral with said first stem being U-shaped and the portion of said flange integral with said second stem being V-shaped, the end sections of said flange portions abutting each other at predetermined angles.

4,705,489

CONSTANT ANGLE SHAFT COUPLING

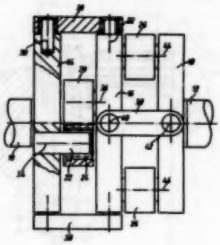
Walter Haarmann, and Hans-Joachim Bremer, both of Wolfenbuttel, Fed. Rep. of Germany, assignors to Barry Wright Corporation, Newton Lower Falls, Mass.

Filed Sep. 14, 1984, Ser. No. 651,183

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1983, 3337714

Int. Cl.[4] F16D *3/04*

U.S. Cl. 464—69 **10 Claims**



1. A constant angle shaft coupling, comprising:

(a) a first outer rotary member adapted for connection to a first shaft rotatable about a first axis;

(b) an intermediate member;

(c) a first pair of guide links pivotally connected at one end to the first outer rotary member and at the other end to the intermediate member, and having pivotal axes parallel to the first shaft axis;

(d) a second outer rotary member adapted for connection to a second shaft rotatable about a second axis;

(e) a second pair of guide links pivotally connected between the intermediate member and the second outer rotary member at a position circumferentially displaced by 90° from the first pair of guide links, and having pivotal axes parallel to the second shaft axis;

(f) a third pair of guide links pivotally connected between the first rotary member and the intermediate member, and having pivotal axes extending perpendicularly to the planes defined by the pivotal axes of the first pair of guide links; and

(g) a fourth pair of guide links pivotally connected between the intermediate member and the second outer rotary member at a position circumferentially displaced by 90° from the third pair of guide links, and having piovtal axes extending perpendicularly to the planes defined by the pivotal axes of the second pair of guide links.

4,705,490

HOOKE'S-TYPE JOINT FOR A UNIVERSAL SHAFT

Hans Lindenthal, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Dec. 19, 1985, Ser. No. 811,028

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1984, 3446495

Int. Cl.[4] F16D *3/41*

U.S. Cl. 464—132 **15 Claims**

1. A Hooke's-type joint for a universal joint shaft, comprising:

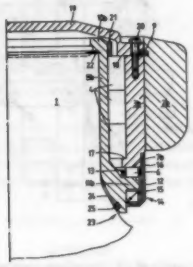
a spider having pins and a root portion at the base of each of said pins, each said pin extending from its respective root portion in a radially outward direction with respect to said spider;

articulation forks having fork arms with bores disposed in said arms for receiving said pins;

an inner ring disposed adjacent each of said pins and having a stop for limiting axial entry of said pin within said inner ring, said stop also receiving axial forces between said

inner ring and said pin, said stop being formed as a first flange at the radially outer end of said inner ring and being directed toward the axis of said pin;

said inner ring also having a second flange axially disposed away from said first flange toward the root portion and directed away from the axis of said pin, said inner ring being shaped to space said second flange away from the pin and from the root portion of the spider and thereby permit bending deformation of said pin with respect to said root portion without said second flange and said root portion coming into contact;



an outer ring secured against the axial displacement in said bore and being outwardly disposed from said inner ring and from the axis of said pin, a thrust bearing race being formed between said second flange of said inner ring, and said outer ring;

radial bearing roller means disposed between a portion of said inner ring intermediate said first and second flanges thereof, and said outer ring; and

thrust bearing roller means disposed in said thrust bearing race.

4,705,491

TELESCOPIC GUIDE, ESPECIALLY FOR TRANSMITTANCE OF TORQUE

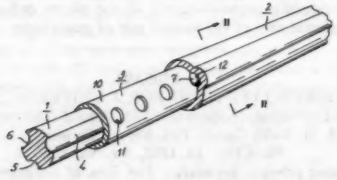
Henry Andersson, Saltsjo-boo, Sweden, assignor to Affarsverket FFV, Eskilstuna, Sweden

Filed Jan. 6, 1986, Ser. No. 816,349

Claims priority, application Sweden, Jan. 22, 1985, 8500286

Int. Cl.[4] F16D *3/06*

U.S. Cl. 464—167 **6 Claims**



1. A telescoping device for transmitting torque in opposite directions of rotation, of the type comprising a telescopic shaft having at least three axially extending guide grooves therein that are spaced apart circumferentially, a telescopic sleeve axially slidably surrounding said telescopic shaft along at least a part of its length and having inwardly opening axially extending counter grooves, one for each guide groove, said counter grooves being so spaced circumferentially that each is opposite its guide groove, and a plurality of torque transmitting round elements, each being of circular cross-section and being received in part in one of said guide grooves and in part in its opposite counter groove, characterized in that:

A. certain of the round elements, received in one of said guide grooves and in its opposite counter groove, are of resiliently elastic material and are under resiliently deformed compression between said telescopic shaft and said telescopic sleeve; and

B. all of the round elements that are received in two other guide grooves and in the respective counter grooves opposite those guide grooves

(1) are of substantially harder and less resilient material than said certain round elements,

(2) cooperate with surfaces of the grooves in which they are received to maintain said certain round elements under said compression, and

(3) are themselves maintained in torque transmitting engagement with said surfaces by the reaction force due to said compression.

4,705,492

AUTOMOTIVE INFINITE TRANSMISSION

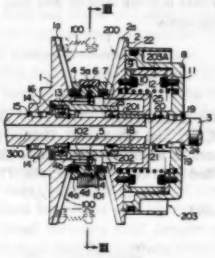
Yoshiyuki Hattori, Toyoake; Ken Nomura, Okazaki; Takahiro Goshima, Kakamigahara, and Hitoshi Tanaka, Obu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

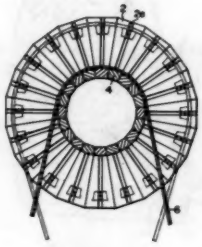
Filed Jun. 26, 1986, Ser. No. 878,779

Claims priority, application Japan, Jun. 27, 1985, 60-141244; Feb. 4, 1986, 61-22450

Int. Cl.[4] F16H *9/02*

U.S. Cl. 474—49 **5 Claims**





1. An automotive infinite transmission having an input pulley, an output pulley, and belt means entrained around said input and output pulleys for transmitting a rotational torque from said input pulley to said output pulley, an effective diameter of each of said input and output pulleys being variable for changing continuously a transmission ratio, each of said input and output pulleys comprising:

a fixed pulley member fixedly mounted on a rotary shaft and having a tapered pulley surface;

a movable pulley member mounted on said rotary shaft for movement axially of said rotary shaft and having a tapered pulley surface, said pulley surface of said movable pulley member cooperating with said pulley surface of said fixed pulley member to define an annular groove having a

generally V-shaped cross-sectional, each of said pulley surfaces of the respective fixed movable pulley members being in the form of a polygonal truncated cone;

actuator means for axially moving said movable member toward and away from said fixed pulley member;

a plurality of generally radially extending slits formed in each of said pulley surface of said fixed pulley member and said pulley surface of said movable pulley member;

a plurality of drive blocks disposed circumferentially along said annular groove between said pulley surface of said fixed pulley member and said pulley surface of said movable pulley member, said drive blocks being in sliding contact with the respective pulley surfaces of said fixed and movable pulley members and being moved radially along said slits when said movable pulley member is moved toward and away from said fixed pulley member by said actuator means;

means for reducing a frictional force between said drive blocks and said pulley surface of said fixed pulley member and a frictional force between said drive blocks and said pulley surface of said movable pulley member;

means for biasing said drive blocks radially inwardly against a centrifugal force applied to said drive blocks when said fixed and movable pulley members are rotated; and

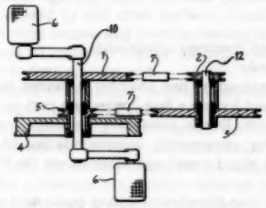
said drive blocks each having a radially outward surface with which said belt means is in frictional contact.

4,705,493

TRANSMISSION MECHANISM FOR GYMNASTIC BICYCLE

Jui-Chin Lin, Kuan Shyh, Taiwan, assignor to Shinn Fu Corporation, Taiwan

Filed Sep. 8, 1986, Ser. No. 904,391
Int. Cl.[4] F16H 9/04
U.S. Cl. 474—69 **1 Claim**



1. An improved transmission mechanism for exercise bicycles comprising:

a first shaft having pedals attached thereto;

a second shaft spaced from said first shaft;

a driving wheel mounted on said first shaft, said driving wheel being drivable by said pedals;

a first transmission wheel mounted on said second shaft, the diameter of said first transmission wheel being equal to ⅓ of that of said driving wheel, and said first transmission wheel being coupled with said driving wheel via a first belt;

a second transmission wheel mounted on said second shaft, the diameter of said second transmission wheel being equal to that of said driving wheel;

a third transmission wheel mounted on said first shaft, the diameter of said third transmission wheel being equal to ⅓ of that of said driving wheel, and said third transmission wheel being coupled with said second transmission wheel via a second belt;

a loaded fly wheel mounted on said first shaft, the diameter of said fly wheel being equal to that of said driving wheel; said loaded fly wheel being driven to rotate upon said third transmission wheel being driven by said second belt; and

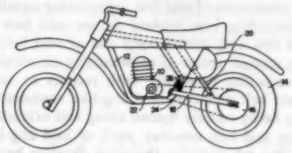
whereby when said pedals drive said driving wheel to rotate one turn, said loaded fly wheel on the first shaft as said driving wheel will rotate nine turns.

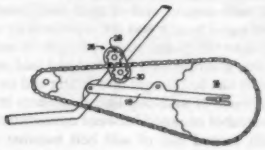
4,705,494

MOTORCYCLE CHAIN DRIVE

Gary S. Gibson, 1661 Deer Run, Gurnee, Ill. 60031

Filed Dec. 2, 1985, Ser. No. 803,247
Int. Cl.[4] F16H 7/08
U.S. Cl. 474—109 **3 Claims**





1. A rear wheel chain drive having a driven roller chain therein comprising:

a. a frame member;

b. a drive sprocket mounted within said frame for engaging the chain;

c. a swing arm pivotally mounted to the frame at a first end thereof;

d. a rear wheel mounted to rotate with respect to said swing arm at the second end thereof;

e. a driven sprocket disposed on said rear wheel adapted to engage the chain; and

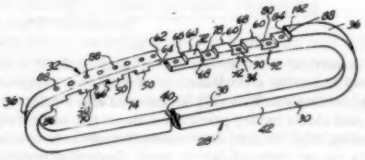
f. chain deflecting means mounted to the frame rearward of said swing arm pivot and above said swing arm between the drive sprocket and the driven sprocket for engaging the span of chain under drive tension for neutralizing the resultant effect on the swing arm by the chain tension.

4,705,495

EMERGENCY V-BELT

Herbert E. Madion, 41329 GlocaMora St., Mt. Clemens, Mich. 48045

Continuation of Ser. No. 653,306, Sep. 20, 1984, abandoned. This application Apr. 11, 1986, Ser. No. 850,722
Int. Cl.[4] F16G 7/06
U.S. Cl. 474—255 **1 Claim**



1. A drive belt of the V-belt type comprising an elongated flexible belt member having a first end and a second end, said first end and said second end being adapted to be brought into

facing and overlapping relationship with each other and to be attached to each other to form a continuous closed loop belt, wherein said belt member has an upper surface and a lower surface extending parallel to each other over a substantial length of said belt member, said upper surface being of greater width than said lower surface, said belt member having a longitudinally extending central plane situated substantially at mid-distance between said upper surface and said lower surface, said first end of said belt member comprising a first group of substantially identical cog-like abutments projecting downwardly with respect to said upper surface of said belt member, said cog-like abutments of said first group being equally spaced along and extending transversely across said belt member adjacent said first end, said second end of said belt member comprising a second group of substantially identical cog-like abutments projecting upwardly with respect to said lower surface of said belt member, said cog-like abutments of said second group being equally spaced along and extending transversely across said belt member, each of said cog-like abutments extending substantially the same distance beyond said central plane and comprising a pair of planar end faces each extending normal to said central plane and being joined by a planar surface, wherein consecutive cog-like abutments at said first end and at said second end of said belt member have planar surfaces of equal length and are separated by a distance substantially equal to the planar surface length of each of said cog-like abutments, whereby said first end and said second end of said belt member can be brought into facing and overlapping relationship with each of said cog-like abutments at said first end of said belt member engaged between consecutive cog-like abutments at said second end of said belt member with said planar faces and said planar surfaces in force transmitting and flatly abutting relationship, and further comprising means for fastening said first end and said second end of said belt member together for maintaining said cog-like abutments in inter-engaged relationship, said fastening means comprising at least one fastener extending through one cog-like abutment of either said first or second group and through the space between two cog-like abutments on the other of said first or second group.

4,705,496

ARRANGEMENT INCLUDING AN INVERTER FOR FEEDING SHEETS OF PAPER INTO AN AUTOMATIC ZIGZAG FOLDING MACHINE

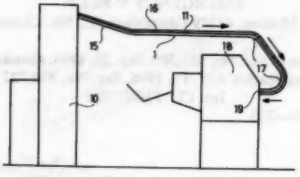
Otto Bay, Luzernstrasse 45, CH-4553 Subingen, Switzerland

Division of Ser. No. 785,060, Oct. 4, 1985, abandoned. This application Mar. 20, 1987, Ser. No. 6,890

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1984, 3439423

Int. Cl.[4] B31B *1/88*

U.S. Cl. 493—320 **5 Claims**



1. A method of inverting and folding each of a series of moving sheets in a combination of a known programmable zigzag folding machine (18), an inverter and a printing means (10), said sheets having printed indicia on one surface adjacent a leading edge thereof into respective packets bearing said indicia on an outward-facing panel thereof, comprising the steps of

advancing each sheet from said printing means (10) with said one surface uppermost,

turning each sheet upside down in said inverter by guiding it around a bend (17) having a substantially horizontal axis perpendicular to the advance of said sheet, thereby changing the direction of advance of said sheet by about 180 degrees

advancing said sheet into an entrance (19) of said folding machine (18),

zigzag-folding said sheet in said folding machine in a known manner, and

ejecting a folded packet from said folding machine.

4,705,497

BLOOD RESERVOIR

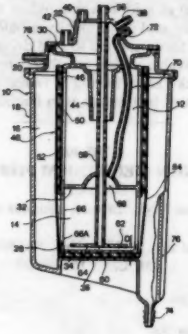
Sachiro Shitaokoshi; Mamoru Sekiguchi; Toshiaki Takagi, all of Fujinomiya, and Toshimichi Mori, Tokyo, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1986, Ser. No. 868,094

Claims priority, application Japan, May 31, 1985, 60-116509

Int. Cl.[4] A61M *37/00*

U.S. Cl. 604—4 **16 Claims**



1. A blood reservoir comprising:

a main body;

a blood extraction line chamber provided inside said main body and having a first connection port to which a blood extraction line is connected, said blood extraction line chamber temporarily accommodating blood extracted from a blood vessel and received via the first connection port;

a suction line chamber provided inside said main body and having a second connection port to which a suction line is connected, said suction line chamber temporarily accommodating pumped-in blood requiring filtering/defoaming and received via the second connection port;

a blood pooling chamber provided inside said main body and communicating with said blood extraction line chamber and said suction line chamber for pooling blood accommodated by said blood extraction line and suction line chambers, said blood pooling chamber having a blood outflow port;

filtering/defoaming means arranged in a region communicating said suction line chamber and said blood pooling chamber for filtering and defoaming blood accommodated in said suction line chamber;

an extracted blood inflow tube having one end communicating with the first connection port and another end open to said blood extraction line chamber, said extracted blood inflow tube being so provided as to extend at least into said blood extraction line chamber for guiding blood, which has been brought in from the blood extraction line via the first connection port, into said blood extraction line chamber; and

a blood dispersing plate attached to and extending laterally from a peripheral portion of an opening at said another end of said extracted blood inflow tube and opposing a

bottom portion of said blood extraction line chamber across a predetermined distance.

4,705,498

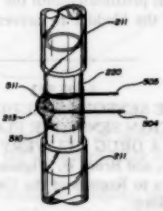
DISPOSABLE TEMPERATURE PROBE FOR PHOTOACTIVATION PATIENT TREATMENT SYSTEM

Jack Goss, Clearwater, Fla., assignor to McNeilab, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 665,834, Oct. 29, 1984, Pat. No. 4,573,960. This application Feb. 27, 1986, Ser. No. 834,294

Int. Cl.[4] A61M *37/00*

U.S. Cl. 604—6 **11 Claims**



1. In a patient treatment system, a temperature probe assembly for measuring the temperature of blood flowing along a flow path in a disposable irradiation chamber, said probe assembly comprising:

(a) a biocompatible conductive tube means having an outer and an inner surface, said tube means inserted into fluid communication with said blood flow path of said disposable irradiation chamber whereby blood is in contact with said inner surface;

(b) a bimetallic, thermocouple junction permanently and thermally affixed to said outer surface of said thermally conductive tube means, said junction having two exposed output leads of different metals for providing a signal responsive to temperature; and

(c) contact means for providing electrical connection to said exposed output leads, said contact means mounted upon temperature stabilizing means wherein said temperature stabilizing means is thermally and electrically in contact with electronic processing means for processing said signal whereby a constant temperature between said electrical connection to said exposed output leads and said electronic processing means is maintained.

4,705,499

IMPLANTABLE SERVO VALVE HAVING INTEGRAL PRESSURE SENSOR

Michael D. Hooven, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Dec. 23, 1985, Ser. No. 812,813

Int. Cl.[4] A61M *27/00*

U.S. Cl. 604—9 **16 Claims**

1. A cerebrospinal fluid pressure relief valve for subcutaneous implantation through a burr hole in the skull of a patient and responsive to pressure deformation of the underlying dura mater for controlling the flow of fluid from an associated ventricular location to a drainage location, comprising:

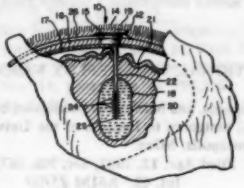
a housing dimensioned to extend through the burr hole and defining an interior chamber open at one end and closed at the other end;

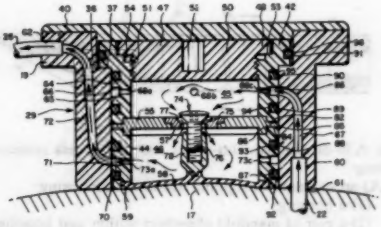
a flexible diaphragm extending over and closing the open end of said chamber, said diaphragm being arranged for engagement and movement with the underlying dura mater;

partition means form within said interior chamber an inlet chamber and an outlet chamber, and a passageway providing fluid communication therebetween;

inlet port means providing fluid communication between the ventricular location and said inlet chamber;

outlet port means providing fluid communication between said outlet chamber and the drainage location; and





valving means operatively connected to said diaphragm controlling fluid flow through said passageway, said valving means increasing flow through said passageway in response to increased deflection of said diaphragm, and decreasing flow in response to decreased deflection, to relieve excessive fluid pressure at the ventricular location.

4,705,500

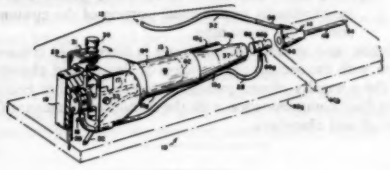
OPHTHALMIC ASPIRATOR-IRRIGATOR

Harry G. Reimels, Braintree; David A. Walsh, Waltham, and Michael J. Arsenault, Brant Rock, all of Mass., assignors to Mentor O & O, Inc., Norwell, Mass.

Filed Jul. 17, 1986, Ser. No. 886,371

Int. Cl.[4] A61B *17/32*

U.S. Cl. 604—35 **18 Claims**



1. An ophthalmic aspirator-irrigator comprising:

(a) a hand-held device;

(b) said device including a cannula having an axial channel and a surrounding annular channel, pressure-differential creating means connected to said axial channel, and drive means operatively connected to said last means for driving the same;

(c) a source of fluid connected via a flexible tube to said annular channel;

(d) foot-operable control means for controlling the operation of said drive means and provided with a pedal, a power source, a circuit connected to said source, and a socket coupled to said circuit;

(e) a flexible power cord having a plug designed to be con-

nected to said socket for coupling power from said power source to said drive means; and

(f) a container enclosing said cannula and said pressure-differential creating means;

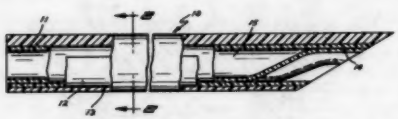
(g) said foot-operable control means being portable and said power source comprising a battery pack.

4,705,501

BI-DIRECTIONAL, ANTI-REFLUX VASCULAR ACCESS SYSTEM

Bruce D. Wigness, and Michael H. Anderson, both of Minneapolis, Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Apr. 12, 1982, Ser. No. 367,683
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—43 **10 Claims**



1. A bi-directional, anti-reflux vascular access system comprising:

(A) an implantable septum/manifold comprising:

(1) a housing;

(2) a pair of manifold chambers within said housing;

(3) first entry means to said chambers,

(4) a self-sealing septum closing the first entry means to each of said chambers, and

(5) separate second entry means to each of said chambers, and

(B) an implantable catheter joined to said septum/manifold and comprising:

(1) an inner collapsible flexible tube closed at the distal end, and

(2) an outer flexible tube of substantially the same length as the inner tube closely embracing the outer wall of the inner tube,

(a) said outer tube being open at both ends,

(b) the inside wall of said outer tube normally engaging the outside wall of the inner tube in a separate non-adherent relationship over a substantial portion of the circumference of the inner tube, forming a normally closed passage between the tubes, and

(c) the inner and outer tubes being joined together longitudinally over a small portion of the circumference of the inner tube,

the inside tube of said catheter being in direct fluid communication with the second entry means of one of said chambers, and the normally closed passage between the tubes being in direct fluid communication with the second entry means of the other of said chambers.

4,705,502

SUPRAPUBIC CATHETER WITH DUAL BALLOONS

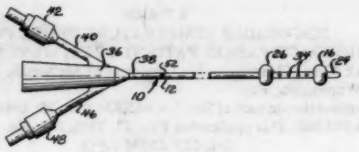
Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 795,308, Nov. 6, 1985, abandoned, which is a division of Ser. No. 651,371, Sep. 17, 1984, abandoned. This application Dec. 31, 1986, Ser. No. 948,186
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—49 **1 Claim**

1. A method of performing a suprapubic procedure comprising the steps of:

passing the shaft of a catheter through the abdominal wall of a patient's body until a distal portion of the shaft containing a first distal sleeve and a second proximal sleeve is located in the patient's bladder;

inflating the first and second sleeves in the bladder with the inflated first sleeve preventing passage of the shaft into the urethra; and



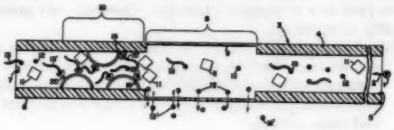
pulling the shaft proximally until the inflated second sleeve seals against the bladder to prevent leakage around the shaft.

4,705,503

METABOLITE SENSOR INCLUDING A CHEMICAL CONCENTRATION SENSITIVE FLOW CONTROLLER FOR A DRUG DELIVERY SYSTEM

Frank D. Dorman, and Bruce D. Wigness, both of Minneapolis, Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Feb. 3, 1986, Ser. No. 825,211
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—50 **36 Claims**



1. A method for the measurement of the concentration of a metabolite present in a physiological fluid such as blood, comprising the steps of:

(a) inserting a catheter into a stream of said blood containing the metabolite;

(b) flowing an aqueous infusate into said catheter at a pressure above that of the blood stream, wherein said infusate contains a concentration of said blood metabolite which is higher than the concentration of the metabolite in the blood;

(c) contacting said flowing infusate with a microporous segment of the wall of said catheter for a period of time effective to bring the concentration of the metabolite within the infusate and the concentration of the metabolite in the blood into equilibrium;

(d) measuring the concentration of the metabolite in the flowing infusate by means of a sensor positioned within the catheter downstream from the microporous segment; and

(e) passing said flowing infusate out the catheter and into the blood.

4,705,504

BREAST PUMP

Karen A. Viers, 31133 Windsor, Westland, Mich. 48185

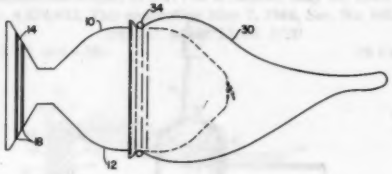
Filed Dec. 23, 1986, Ser. No. 945,688
Int. Cl.[4] A61M *1/06*
U.S. Cl. 604—75 **3 Claims**

1. A breast pump, comprising:

a resilient, squeezable, hollow, suction member, having an inlet opening, a discharge opening, and reservoir means between the inlet opening and the discharge opening, the suction member being inflatable after being squeezed, so as to apply a negative pressure on the inlet opening;

means mounted on the suction member adjacent the inlet opening for receiving a nipple in a sealing relationship;

valve means mounted in the discharge opening for removal of a liquid from the reservoir means as the suction member is being deflated by a squeezing motion, and for receiving a liquid through the inlet opening as the suction member is being inflated;



a disposable, removable bag having an opening suited for receiving a portion of the suction member about the discharge opening; and

means on the suction member for retaining the opening of the removable bag around the portion of the suction member such that liquid from the reservoir means is discharged to the removable bag as the suction member is being deflated.

4,705,505

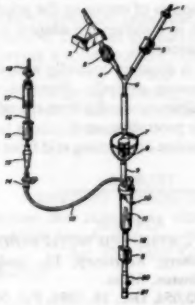
RAPID SOLUTION ADMINISTRATION SET WITH INTEGRAL HEAT EXCHANGER

Steven J. Fried, 1729 Willow Park Ct., Powell, Ohio 43065

Continuation of Ser. No. 655,379, Sep. 28, 1985, Pat. No. 4,623,333. This application Nov. 13, 1986, Ser. No. 930,739

Int. Cl.[4] A61M *5/14*

U.S. Cl. 604—80 **14 Claims**



1. A pump free intravenous set for the rapid infusion of physiologic solutions to treat a patient in hypovolemic shock comprising

an infusion line having means at its distal end for connecting the line to a venous pathway of the patient,

inlet means mounted on the proximal end of the infusion line for connecting the line to a source of physiologic solution at a temperature below normothermic temperature,

and a heat exchanger disposed in the infusion line through which the solution flows for heating the solution to place it a normothermic temperature,

said infusion line, inlet means, means on the distal end of the line and the heat exchanger being sized to recieve and discharge said solution at a rapid rate to restore and maintain the normal circulating blood volume of a patient in hypovolemic shock, in response to a pressure head established by the difference in height of the proximal and distal ends of the infusion line.

4,705,506

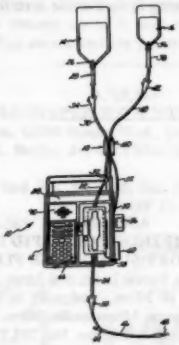
MULTIPLE SOLUTION IV SYSTEM WITH SETUP ERROR PROTECTION

G. Kent Archibald, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 676,009, Nov. 29, 1984. This application Nov. 14, 1985, Ser. No. 798,228

Int. Cl.[4] A61M *5/14*

U.S. Cl. 604—81 **17 Claims**



2. An IV administration system comprising:

a first source of multiple doses of a first IV fluid;

a second source of a second IV fluid; an IV control device for delivering IV fluids at a a rate determined by a rate control signal;

valve means for controlling fluid flow from the first and second sources to the IV control device as a function of a valve control signal;

means for connecting the IV control device to a patient;

control means for providing the rate control signal and the valve control signal to cause the IV control device to deliver the first IV fluid to the patient at a first rate until a first volume has been delivered and the second IV fluid to the patient at a second rate until a second volume has been delivered;

user-actuated means for entering numerical values representing first and second rates and first and second volumes to be used by the control means; and

means for storing a required mathematical relationship between at least two of the numerical values;

error check means responsive to the user-actuated means for providing an error signal if at least two of the numerical values fail to satisfy the required mathematical relationship.

4,705,507

ARTERIAL CATHETER MEANS

Paul W. Boyles, 407 Glasgow Rd., Cary, N.C. 27511

Continuation-in-part of Ser. No. 606,255, May 2, 1984, Pat. No. 4,592,340. This application Apr. 28, 1986, Ser. No. 856,206

Int. Cl.[4] A61M *29/00*

U.S. Cl. 604—101 **1 Claim**

1. An arterial catheter means for insertion into an arterial passage comprising: a flexible, tube-like base member having

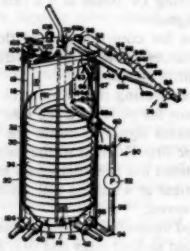
an intermediate portion and a distal end portion; a first inflatable balloon means encircling said distal end portion of said base member; second inflatable balloon means encircling said intermediate portion; air passage means communicating with said first and second inflatable balloon means; blood flow passage means extending from said distal end portion to an intermediate portion of said base member between said first and second inflatable balloon means; a blood flow outlet formed in said base member between said first and second balloon means, said blood flow outlet communicating between said arterial passage and said blood flow passage; and self-actuating valve means operatively connected to the exterior of said base member for permitting blood to flow through said blood flow passage during systole while arresting flow during diastole.

4,705,508

APPARATUS AND METHOD FOR RAPID INFUSION OF CIRCULATORY SUPPORTIVE FLUIDS

Alexander G. Karnavas, Forest Lake, and Jorge A. Estrin, Mendota Heights, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Sep. 30, 1985, Ser. No. 781,774
Int. Cl.[4] A61M *1/36*
U.S. Cl. 604—113 **21 Claims**



1. An apparatus for rapid infusion of circulatory supportive fluid into a patient, which comprises:

(a) an enclosed housing for retaining a predetermined quantity of circulatory supportive fluid prior to infusion, said housing having a top surface, a bottom surface, and a surrounding side wall joining the top surface and the bottom surface, and having an upper zone and a lower zone therein;

(b) positioned within the housing in the lower zone, heat exchanger means for warming the fluid prior to infusion;

(c) attached to the housing, in fluid communication with the upper and lower zones therein, means including an exterior pump for circulating the fluid within the housing prior to infusion;

(d) located on the housing, means for permitting oxygen saturation of the fluid within said housing prior to infusion; and

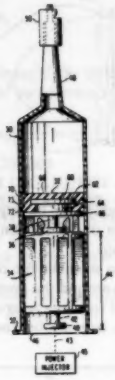
(e) connected to the circulating means, means for selectively connecting the circulating fluid in fluid communication with the patient to effect rapid infusion.

4,705,509

POWER SYRINGE WITH VOLUME REDUCING ADAPTER

John H. Stade, Ferguson, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Continuation of Ser. No. 799,314, Nov. 18, 1985, Pat. No. 4,636,198. This application Dec. 15, 1986, Ser. No. 941,355
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—154 **6 Claims**



1. An adapter for adjusting the internal volume of a syringe containing a piston having a machine-grippable protrusion thereon, said adapter being a generally elongate body configured for insertion into a cylindrical syringe barrel and comprising:

(a) a front disc having centrally disposed on one on one side thereof, and extending outwardly from the adapter body, gripping means capable of engaging the grippable protrusion on the pistion to maintain the adapter and the piston in an abutting relationship;

(b) a rear disc which is disposed coaxially with the front disc, said rear disc having centrally disposed on one side thereof and extending outwardly from the adapter body a machine grippable protrusion; and

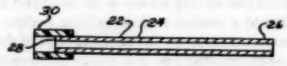
(c) a central body portion connecting said front disc and rear disc.

4,705,510

NEPHROSTOMY CATHETER WITH FORMED TIP

Helmut W. G. Rosenberg, McHenry, Ill., assignor to The Kendall Company, Boston, Mass.

Division of Ser. No. 683,056, Dec. 18, 1984, Pat. No. 4,645,490. This application Oct. 17, 1986, Ser. No. 920,810
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—280 **1 Claim**



1. A stylet assembly for performing a nephrostomy procedure, comprising:

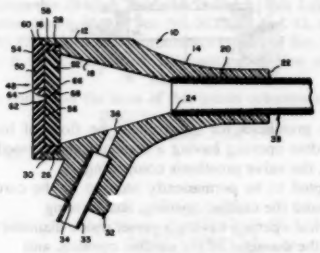
a hollow rigid tube having a distal end, and a proximal end;

a hollow flexible tube extending from the proximal end of the tube;

an elongated catheter having a lumen extending therethrough, a proximal end, and a distal end, with the stylet

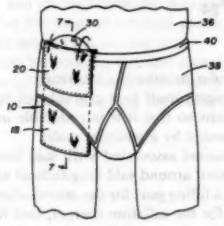
being received in the lumen with a distal end of the stylet located adjacent a distal end of the catheter;
and a guidewire received in the stylet.

4,705,511
INTRODUCER SHEATH ASSEMBLY
Nuri Kocak, Cliffside Park, N.J., assignor to Bipore, Inc., Demarest, N.J.
Continuation-in-part of Ser. No. 6,733,556, May 13, 1985, Pat. No. 4,634,432. This application May 7, 1986, Ser. No. 860,645
Int. Cl.[4] A61M *25/00, 5/00*
U.S. Cl. 604—282 **28 Claims**



1. A flexible tube for the introduction of catheters and like devices into a vascular system, comprising:
- a helical coiled spring having a plurality of coils, each of a plurality of said coils being spaced from at least one adjacent coil; and
- a thin cylindrical wall prepared from a protective coating composition completely surrounding said spring to define an inner wall surface and a substantially smooth outer wall surface, said cylindrical wall surrounding said spring having a substantially constant thickness throughout its length;
- said coating composition comprising a thermoplastic polymeric material dissolved in a solvent solution, said composition having a solids content ranging from about 4% to about 18%, and said solution comprising a solvent selected from the group consisting of tetrahydrofuran, dioxane, methyl ethyl ketone, dimethylformamide, cyclohexane, and mixtures thereof.

4,705,512
OSTOMY POUCH COVER
Paul W. Faucher, Box 142A, Lake Village, Ind. 46349
Filed Aug. 5, 1986, Ser. No. 893,393
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—332 **10 Claims**



1. An ostomy cover for an ostomy pouch of the type comprising a waterproof pouch having an opening engaging with a fitting worn by a patient under the patient's underpants having a waistband, below the waist of a patient with the pouch extending and having a bottom below that fitting, said cover comprising:
- a back panel of flexible fabric; a front panel of flexible material secured to the back panel along its sides, said front and back panel thus forming a tubular structure of flexible material, which structure is open at its top and is sized to fit over the bottom of the ostomy pouch and have said back panel extend from the bottom of the fitting to or below the bottom of the pouch;
- a flap means of flexible material secured at the top of said front panel and extending therefrom for a distance sufficient to allow said flap means to extend to and over and around the waistband of the patient's underpants so as to lay flat, in part, outside of the underpants;

whereby said ostomy cover is held in place by the contact between the flap means and the patient's clothing.

4,705,513
DISPOSABLE DIAPER WITH WETNESS INDICATOR
Sidney Sheldon, 10250 Sunset Blvd., Los Angeles, Calif. 90077, and James L. Butler, Jr., 4469 Matilija, Sherman Oaks, Calif. 91423
Filed Jun. 27, 1986, Ser. No. 879,459
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—361 **4 Claims**

1. A diaper assembly capable of providing a visible indication when wet, said diaper assembly comprising an absorbent layer; and a flat strip of absorbent material mounted in said diaper assembly adjacent to the outer surface of said absorbent layer, said flat strip being opaque when dry and essentially transparent when wet, and said flat strip having an insoluble coating imprinted on the surface thereof facing the absorbent layer, said coating being normally shielded by said flat strip and becoming visible through said flat strip when said flat strip absorbs moisture and becomes essentially transparent.

4,705,514
ABSORBENT DENTAL ROLL
Ralph G. Barnard, Gastonia, N.C., assignor to Barnhardt Manufacturing Corporation, Charlotte, N.C.
Filed Jan. 22, 1986, Ser. No. 821,073
Int. Cl.[4] A61F *13/20*
U.S. Cl. 604—383 **9 Claims**

1. An absorbent readily rupturable dental roll comprising an

elongate cylindrical resilient body of predetermined length formed of highly absorbent cellulosic fibers in compact dense condition, an open-ended tubular wrapper surrounding and covering said resilient body and holding the body of cellulosic fobers in the compact dense condition, said wrapper being formed of readily rupturable material for facilitating lengthwise tearing of the sheet and rupturing of the dental roll, if desired by the dentist, to expand and expose the highly absorbent fibers of the body when using the dental roll as a source for bunches of fibers to be used as a swab, said wrapper comprising a nonwoven elongate fibrous sheet of cellulosic fibers for enhanced moisture absorbency of the dental roll, said elongate fibrous sheet having greater stretchability widthwise than lengthwise thereof and also having linearly arranged overlapping longitudinal edges, and adhesive means extending along said longitudinal edges and securing the fibrous sheet in tubular form so as to form a radially resilient tube for resiliently maintaining said body of cellulosic fibers in the wrapper in compact dense condition and to conform to the contour of the mouth and lip of the patient.

4,705,515

DOSAGE FORM FOR ADMINISTERING DRUG OF THE COLON

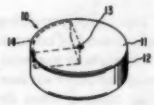
Patrick S. L. Wong, Hayward, and Felix Theeuwes, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

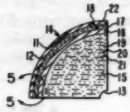
Continuation of Ser. No. 665,332, Oct. 26, 1984, Pat. No. 4,627,851. This application Jun. 23, 1986, Ser. No. 877,048

The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.

Int. Cl.[4] A61K *9/22, 9/24*

U.S. Cl. 604—892 **4 Claims**





2. An osmotic device for the delivery of a drug to a biological environment of use, said device comprising:

(a) a shaped laminated wall comprising: (1) a first lamina comprising at least in part a composition permeable to the passage of fluid and substantially impermeable to the passage of drug; (2) a second lamina comprising a salt of a fatty acid and a polymer permeable to the passage of fluid; and (3) a third lamina comprising a member selected from the group consisting of keratin, keratin sandarac-tolu, salol, shellac, ammoniated shellac, cellulose acetyl with shellac, polyvinyl acid phthalate, acid phthalates of carbohydrates, and starch acetate phthalate; said laminated wall surrounding and defining:

(b) a compartment containing a dosage amount of a beneficial drug formulation; and,

(c) at least one passageway through the laminated wall communicating with the compartment and the exterior of the osmotic device for dispensing the drug formulation from the device to the environment of use.

4,705,516

SETTING FOR A CARDIAC VALVE

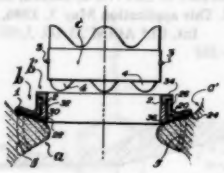
Hector D. Barone, and Jose R. Martin, both of Maza 1869/73, Buenos Aires, Argentina

Filed Nov. 21, 1983, Ser. No. 553,706

Claims priority, application Argentina, Apr. 20, 1983, 292760

Int. Cl.[4] A61F *2/24*

U.S. Cl. 623—2 **10 Claims**



1. A valve prosthesis for controlling the flow of blood through a cardiac opening having a diameter and formed by cardiac tissue, the valve prosthesis comprising:

a stent adapted to be permanently secured to the cardiac tissue around the cardiac opening, and forming

(i) a cylindrical opening having a preset inside diameter not less than the diameter of the cardiac opening, and

(ii) an inside circumferential groove facing and in communication with the cylindrical opening; and

a valve member releasably connected to the stent to control the flow of blood through the cylindrical opening and, thereby, through the cardiac opening, and including

(i) a tubular sidewall, and

(ii) a set of teeth extending outward from the sidewall, and wedged into the circumferential groove of the stent to connect the valve member releasably to the stent.

4,705,517

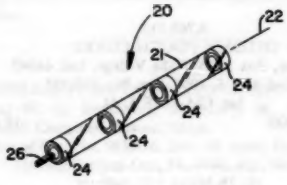
PERCUTANEOUSLY DELIVERABLE INTRAVASCULAR OCCLUSION PROSTHESIS

Joseph A. DiPisa, Jr., Flushing, N.Y., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 3, 1985, Ser. No. 772,217

Int. Cl.[4] A61F *2/06;* A61B *17/12*

U.S. Cl. 623—12 **20 Claims**



1. An intravascular prosthesis comprising:

a lining rolled upon itself in a plurality of turns around a longitudinal axis so that it is introducible into a vascular lumen surrounded by a vascular wall;

an inflatable channel associated with said lining and being rolled upon itself around said longitudinal axis, said channel including a filling port for the introduction of fluid into said channel for the inflation thereof, said lining and said channel having the capability of unrolling when said channel is inflated so that the lining may engage the vascular wall to provide support therefor; and

an occlusion member connected to said lining and positioned so that when the lining is unrolled, said member extends substantially transversely across the interior of said un-

rolled lining to prevent blood from passing through the prosthesis.

4,705,518

ARTIFICIAL SPHINCTER APPARATUS AND METHOD

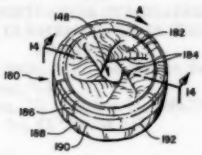
Charles D. Baker, Lehi; Owen D. Brimhall, and Charles R. Galway, both of Salt Lake City, all of Utah, assignors to University of Utah Research Institute, Salt Lake City, Utah

Continuation-in-part of Ser. No. 367,533, Apr. 12, 1982, Pat. No. 4,553,271, which is a continuation-in-part of Ser. No. 194,528, Oct. 6, 1980, abandoned. This application Nov. 18, 1985, Ser. No. 799,846

The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.

Int. Cl.[4] **A61F** *2/08, 2/04*

U.S. Cl. 623—14 **43 Claims**



29. An artificial sphincter for gently constricting a living tissue conduit such that flow of biological materials within the living tissue conduit may be controlled without causing significant pressure necrosis to the living tissue of the conduit, the artificial sphincter comprising:

a first planar ring having an opening with a diameter adequate to at least encircle the living tissue conduit when a maximum flow of biological materials is passing therethrough;

a second planar ring having an opening with a diameter greater than or equal to the diameter of the opening of the first planar ring, the second planar ring being positioned in close proximity to the first planar ring to permit coaxial rotation of the first planar ring relative the second planar ring, the openings in the first and second planar rings generally defining a passageway for encircling the living tissue conduit;

closure means attached to the first and second planar rings for radially narrowing the passageway and gently constricting the living tissue conduit with a combination of rotational and circumferentially localized discrete radial compressive forces upon rotation of the first planar ring relative the second planar ring; and

actuator means for rotating the first planar ring relative the second planar ring to control narrowing and widening of the passageway for receiving the living tissue conduit.

4,705,519

REPAIR MATERIAL FOR USE WITH BONES

William V. Hayes, Bandera, and Turner, Albert H., Houston, both of Tex., assignors to Hayes Separation, Inc., Bandera, Tex.

Division of Ser. No. 706,138, Feb. 27, 1985, Pat. No. 4,643,735. This application Aug. 15, 1986, Ser. No. 896,885

Int. Cl.[4] **A61F** *2/28;* **A61K** *6/08*

U.S. Cl. 623—16 **2 Claims**

1. A composition of matter for repairing an injured bone in a body comprising substantially pure, randomly cross linked polydivinyl benzene in particulate form, essentially free of monomer and catalyst, and which particulate composition enables bone knitting such that the particulate is integrated into the healed bone upon completion of the healing process wherein the composition has a surface area of 150 square meters per gram or more and a weight of about 0.3 to 0.45 gm/cc to linked monomer or polymer having sufficient cross linking to form an irregular shape with pores, the porous particulate composition defining an inert matrix enabling bone growth therewith.

4,705,520

IMPLANT

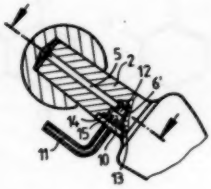
Uwe Ahrens, Berlin, Fed. Rep. of Germany, assignor to Mecron medizinische Produkte GmbH, Berlin, Fed. Rep. of Germany

Filed Apr. 3, 1986, Ser. No. 847,919

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1985, 8510531[U]

Int. Cl.[4] **A61F** *2/36*

U.S. Cl. 623—23 **18 Claims**



10. Implant comprising:

connection means having a cone shaped surface;

a bore disposed along a longitudinal axis of said connection means and extending to a front outer face thereof;

an opening transverse to said axis extending to a surface of said connection means and communicating with said bore at portion thereof remote from said front outer face;

a prosthetic member frictionally secured to said connection means and extending thereover with said opening remaining externally exposed; and

a pin disposed in said bore of length less than said bore, extending to said front outer face at one end thereof and extending to said opening at its other end, whereby said pin is movable in said bore to extend out of said bore beyond said front face in response to a camming action thereon via said opening to release said member from connection on said cone shaped surface.

4,705,521

PROCESS FOR REHEATING DYE-RECEIVING ELEMENT CONTAINING STABILIZER

Gary W. Byers, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 22, 1986, Ser. No. 899,273
Int. Cl.[4] B41M 5/26
U.S. Cl. 8—471 9 Claims

1. A process of forming a stable dye transfer image comprising:

(a) imagewise-heating a dye-donor element comprising a support having thereon a dye layer,

(b) transferring a dye image to a dye-receiving element to form a dye transfer image, said dye-receiving element comprising a support having thereon a dye image-receiving layer containing a stabilizer compound to increase the stability to light of said transferred dye image, and

(c) heating said dye-receiving element containing said transferred dye image, so that stratification of said transferred dye image in said dye-receiving element is reduced, thereby further increasing the stability to light of said transferred dye image.

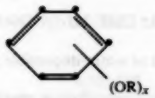
4,705,522

ALKOLXY DERIVATIVE STABILIZERS FOR DYE-RECEIVING ELEMENT USED IN THERMAL DYE TRANSFER

Gary W. Byers, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 22, 1986, Ser. No. 899,274
Int. Cl.[4] B41M 5/26
U.S. Cl. 8—471 20 Claims

10. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer and transferring a dye image to a dye-receiving element to form said dye transfer image, said dye-receiving element comprising a support having thereon a dye image-receiving laye , the improvement wherein said dye image-receiving layer contains a stabilizer compound having the following moiety:



wherein each R is independently an alkyl or substituted alkyl group of from 1 to about 20 carbon atoms, or two adjacent R groups may be joined together to form methylene or ethylene; and x is at least 3.

4,705,523

PROCESS FOR IMPROVING THE FLAME-RETARDANT PROPERTIES OF PRINTED SHAPED ARTICLES FROM ARAMID FIBERS

Samir Hussamy, Lynchburg, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 863,011, May 14, 1986. This application Jun. 4, 1986, Ser. No. 870,524
Int. Cl.[4] D06P 5/00
U.S. Cl. 8—490 25 Claims

1. A process of printing a predetermined pattern and improving the flame resistance of a poly(m-phenyleneisophthalamide textile fabric comprising the successive steps of:

(a) applying a print paste, consisting essentially of a highly polar solvent poly(m-phenyleneisophthalamide) fiber swelling agent selected from the group consisting of dimethylsulfoxide, N,N-dimethylformamide, N,N-dimethylacetamide, N-methyl-2-pyrrolidone, and mixtures thereof which solvent is adapted to swell the fiber and introduce a dyestuff therein, at least one organic dyestuff that is soluble in the polar solvent, at least one flame retardant that is soluble in the print paste, a print paste thickening agent compatible with the polar solvent with a viscosity in the range of about 5,000 to about 36,000 cps, and water, in a predetermined pattern onto the surface of the fabric; and

(b) drying and curing the thus printed fabric at an elevated temperature sufficient to permeate and fix the dyestuff and the flame-retardant molecules inside the poly(m-phenyleneisophthalamide) fibers.

4,705,524

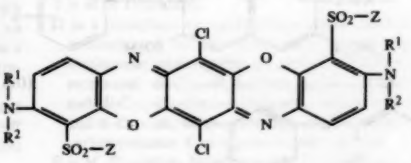
MIXTURES OF WATER-SOLUBLE FIBER-REACTIVE DYES AND USE THEREOF FOR DYEING: DIOXAZINE AND DISAZO DYES

Manfred Hähnke, Kelkheim, Fed. Rep. of Germany, and Marcos Segal, Suzano, Brazil, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

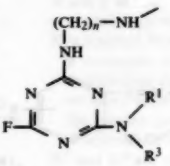
Filed Nov. 25, 1986, Ser. No. 934,688
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1985, 3542025
Int. Cl.[4] C09B 67/00, 67/22; D06P 1/38
U.S. Cl. 8—527 14 Claims

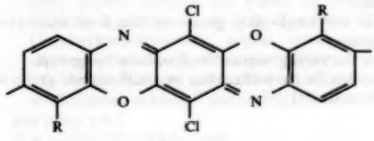
1. A composition of water-soluble fiber-reactive dyes, which contains or substantially comprises one or more dyes which are selected from dyes of the formulae (Ia) and (Ib), and one or more dyes which are selected from dyes of the formulae (IIa), (IIb), (IIc) and (IId), in a ratio of 90:10 to 10:90 parts by weight of dyes (I) and (II):

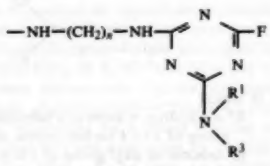
(Ia)



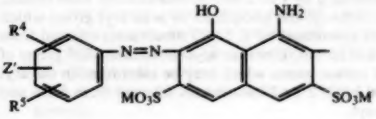
(Ib)







(IIa)



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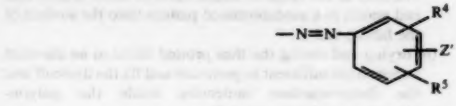
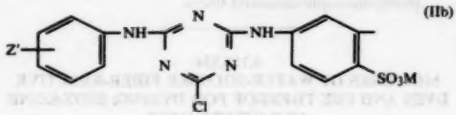
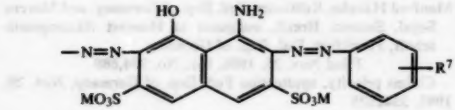


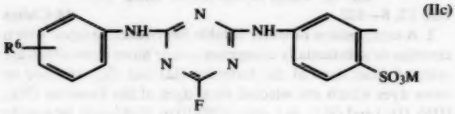
(IIb)

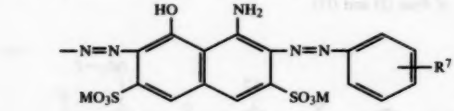


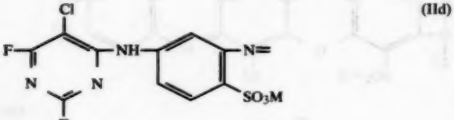
(IIc)



(IId)





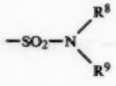


in which

Z is the vinyl—SO_2 group or the β-sulfatoethyl—SO_2 group,

Z' is the vinyl group or the β-sulfatoethyl group,

R stands for the sulfo group or a sulfonamide group of the formula (III)



(III)

in which

R^8 is a hydrogen atom or a substituted or unsubstituted alkyl group of 1 to 4 carbon atoms, and

R^9 denotes an alkyl group of 1 to 4 carbon atoms which may be substituted by 1 or 2 substituents selected from sulfato, sulfo, carboxyl and phosphato, or is an aryl group which may be substituted by 1, 2 or 3 substituents selected from sulfo and carboxyl, or is an aryl-substituted alkyl group of 1 to 4 carbon atoms which may be substituted in the aryl radical by 1, 2 or 3 substituents selected from sulfo and carboxyl,

R^1 is a hydrogen atom or a substituted or unsubstituted alkyl group of 1 to 4 carbon atoms,

R^2 is an alkyl group of 1 to 4 carbon atoms which may be substituted by 1 or 2 substituents selected from sulfato, sulfo, carboxyl and phosphato, or is an aryl group which may be substituted by 1, 2 or 3 substituents selected from sulfo and carboxyl, or is an aryl-substituted alkyl group of 1 to 4 carbon atoms which may be substituted in the aryl radical by 1, 2 or 3 substituents selected from sulfo and carboxyl,

R^3 is an alkyl group of 1 to 4 carbon atoms which may be substituted by 1 or 2 substituents selected from sulfato, sulfo, carboxyl and phosphato, or is a phenyl group which is substituted by 1 or 2 substituents selected from sulfo and carboxyl,

R^4 is a hydrogen atom or a sulfo group, a carboxyl group, an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms or a bromine atom,

R^5 is a hydrogen atom or a sulfo group, a carboxyl group, an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms or a bromine atom,

R^6 is an alkyl group of 1 to 4 carbon atoms, a hydroxyl group, a carboxyl group, a sulfo group or a chlorine atom,

R^7 is a sulfo group, a sulfonamide group conforming to the formula (III) mentioned and defined above or is a carboxyl group,

n stands for the number 1, 2 or 3

M is a hydrogen atom or an alkali metal.

4,705,525

WATER-SOLUBLE OR WATER-DISPERSIBLE GRAFT POLYMERS, PROCESS FOR THEIR PREPARATION AND THE USE THEREOF

Heinz Abel, Reinach, Switzerland; Paul Schäfer, Oberried, Fed. Rep. of Germany, and Hans-Ulrich Berendt, Allschwil, Switzerland, assignors to CIBA-GEIGY Corporation, Ardsley, N.Y.

Filed Jun. 19, 1986, Ser. No. 876,033

Claims priority, application Switzerland, Jun. 28, 1985, 2751/85-7

Int. Cl.[4] **C08F** *283/06;* **D06P** *1/61*

U.S. Cl. 8—555 **20 Claims**

1. A water-soluble or water-dispersible graft polymer which comprises

(A) as main chain, a polyalkylene glycol which is esterified at the two terminal hydroxyl groups with a fatty acid of 8 to 26 carbon atoms and

(B) an ethylenically unsaturated monomer which is grafted in the form of side chains at individual carbon atoms of said polyalkylene glycol chain.

4,705,526

WATER-SOLUBLE OR WATER-DISPERSIBLE GRAFT POLYMERS AND THE PREPARATION AND USE THEREOF

Heinz Abel, Reinach, Switzerland; Paul Schäfer, Oberried, Fed. Rep. of Germany, and Hans-Ulrich Berendt, Allschwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 19, 1986, Ser. No. 876,034

Claims priority, application Switzerland, Jul. 18, 1985, 3120/85

Int. Cl.[4] **C08F** *283/01;* **C08G** *63/66;* **D06P** *1/61*

U.S. Cl. 8—555 **13 Claims**

1. A water-soluble or water-dispersible graft polymer which comprises (i) as main chain, a condensate of (A)(1) an aliphatic monoalcohol of 6 to 22 carbon atoms or (2) a fatty acid of 8 to 22 carbon atoms with (B) the reaction product of

(a) an adduct of propylene oxide with a trihydric to hexahydric aliphatic alcohol of 3 to 10 carbon atoms,

(b) an aliphatic dicarboxylic acid of 4 to 10 carbon atoms or the anhydride thereof, and

(c) an aliphatic diol having an average molecular weight of not more than 1800, and

(ii) grafted ethylenically unsaturated monomers in the form of side chains at individual carbon atoms of said condensate, wherein said monomers contain acid water-solubilizing groups.

4,705,527

PROCESS FOR THE PRINTING OF SHAPED ARTICLES DERIVED FROM ARAMID FIBERS

Samir Hussamy, Lynchburg, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed May 14, 1986, Ser. No. 863,011

Int. Cl.[4] C09B *67/00*

U.S. Cl. 8—558 **33 Claims**

1. A process of printing a predetermined pattern on a poly(m-phenyleneisophthalamide) textile fabric comprising the successive steps of:

(a) applying a print paste, consisting essentially of a higher polar solvent poly(m-phenyleneisophthalamide) fiber swelling agent adapted to swell the poly(m-phenyleneisophthalamide) fiber and introduce a dyestuff therein, the highly polar solvent selected from the group consisting of dimethylsulfoxide, N,N-dimethylformamide, N,N-dimethylacetamide, N-methyl-2-pyrrolidone, and mixtures thereof, at least one organic dyestuff that is soluble in the polar solvent, a print paste thickening agent that is soluble in the polar solvent and compatible with both the polar solvent and the dyestuff and water in an amount of from about 5 to about 20% by weight, in a predetermined pattern onto the surface of the poly(m-phenyleneisophthalamide) textile; and

(b) drying and curing the thus printed fabric at an elevated temperature sufficient to permeate and fix the dyestuff molecules inside the poly(m-phenyleneisophthalamide) fibers.

4,705,528

WATER-SOLUBLE TRIAZINE BLACK DYES FROM CELLULOSE REACTIVE GROUPS AND SUITABLE FOR USE IN INKS

Anthony G. W. Baxter, Manchester; Stephen B. Bostock, Bury, and David Greenwood, Oldham, all of England, assignors to Imperial Chemical Industries PLC, London, England

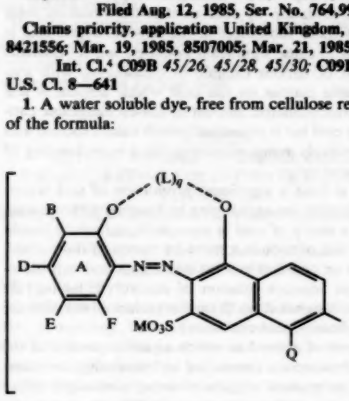
Filed Aug. 12, 1985, Ser. No. 764,997

Claims priority, application United Kingdom, Aug. 24, 1984, 8421556; Mar. 19, 1985, 8507005; Mar. 21, 1985, 8507310

Int. Cl.[4] C09B *45/26, 45/28, 45/30*; C09D *11/02*

U.S. Cl. 8—641 **14 Claims**

1. A water soluble dye, free from cellulose reactive groups, of the formula:



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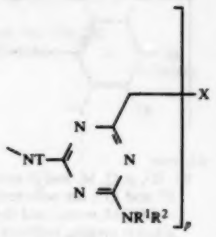


wherein

R^1 is $-(C_aH_{2a}O)_m(C_bH_{2b}O)_nH$,

R^2 is H or $-(C_aH_{2a}O)_m(C_bH_{2b}O)_nH$, or

R^1 and R^2 together with the nitrogen atom form a morpholine ring,

a and b are different and are from 2 to 8,

m is from 1 to 10,

n is from 0 to 9,

g is $\frac{1}{2}$ or 1,

p is 1 or 2,

L is chromium, cobalt, copper or a mixture thereof,

M is H, ammonium, or an alkali metal,

Q is H or SO_3M,

T is H or C_{1-4}-alkyl,

D is a phenylazo or naphthylazo group each of which is unsubstituted or substituted by a group selected from sulphonate; carboxylate; C_{1-4}-alkyl; C_{1-4}-alkoxy; ureido; mono-and di-C_{1-4}-alkylamino; aminosulphonyl; mono- and di-C_{1-4}-alkylaminosulphonyl; aminocarbonyl; mono- and di-C_{1-4}-alkylaminocarbonyl; phenylamino; C_{1-4}-alkylcarbonylamino; hydroxy; nitro and halogen,

E is H, C_{1-4}-alkyl, halogen and aminosulphonyl,

B and F are H,

provided that: when p=1

X is selected from (i) NR^1R^2; (ii) NR^3R^4; (iii) OR^3; and (iv) a monoazo chromophore, derived from a benzene or naphthalene diazo component and a benzene, naphthalene or mono-heterocyclic coupling component and linked to the triazine group through a group $-NR^5-$ in which R^5 is selected from H, C_{1-4}-alkyl and phenyl; and

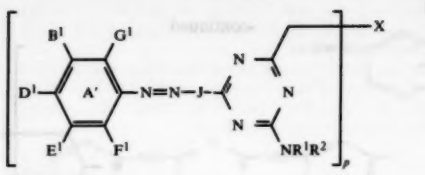
R^3 and R^4 are each independently selected from H, C_{1-4}-alkyl, phenyl, naphthyl and phenyl or naphthyl substituted by a group selected from C_{1-4}-alkyl, C_{1-4}-alkoxy, C_{1-4}-alkylcarbonylamino, ureido, mono- and di-C_{1-4}-alkylamino, nitro, phenylamino, halogen, carboxylate, sulphonate, hydroxy and unsubstituted and mono- and di-alkylamino-sulphonyl and carbonyl; and

and when p=2

X is $-NR^3-Z-NR^3-$; and

Z is selected from C_{1-6}-alkylene; phenylene; biphenylene; C_{1-4}-alkylenephen-4-ylene; C_{1-6}-alkylene, phenylene, biphenylene or C_{1-4}-alkylenephen-4-ylene interrupted by a group selected from CH_2, O, S, NR^3 and SO_2; and C_{1-6}-alkylene; phenylene, biphenylene; C_{1-4}-alkylene-phen-4-ylene; C_{1-6}-alkylene, phenylene, biphenylene or C_{1-4}-alkylenephen-4-ylene interrupted by a group selected from CH_2, O, S, NR^3 and SO_2 and substituted by a group selected from C_{1-4}-alkyl, C_{1-4}-alkoxy, C_4-alkyl-carbonylamino, ureido, mono- and di-C_{1-4}-alkylamino, nitro, phenylamino, halogen, carboxylate, sulphonate, hydroxy NH_2SO_2-, NH_2CO- and mono- and di-alkylamino-sulphonyl and carbonyl.

13. A mixture of a dye according to claim 1 and a dye of the formula:

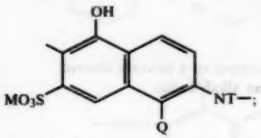


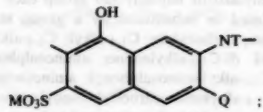
II

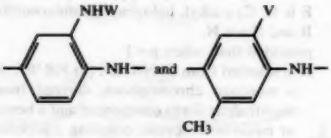
wherein

R^1, R^2, p, Q, M, and X are as defined in claim 1; B^1, D^1, E^1, F^1 and G^1, are selected from H; $-SO_3M$; $NHCOCH_3$; —COOM; mono- and di-C_{1-4}-alkylamino; C_{1-4}-alkyl; C_{1-4}-alkoxy; ureido; hydroxy; nitro and halogen or B^1 and D^1 form a second benzene ring fused to ring A which is unsubstituted or substituted by a group selected from H; $-SO_3M$; $NHCOCH_3$; —COOM; mono- and di-C_{1-4}-alkylamino; C_{1-4}-alkyl; C_{1-4}-alkoxy; ureido; hydroxy; nitro and halogen, provided that neither F^1 nor G^1 is hydroxy; and

J is selected from:







wherein

T is H, alkyl or phenyl;

W is an acyl group selected from the group consisting of aminocarbonyl, aminosulphonyl, C_{1-4}-alkylcarbonyl, C_{1-4}alkylsulphonyl, phenylcarbonyl and phenylsulphonyl; and

V is alkyl or alkoxy.

4,705,529

PROCESS FOR REDUCING THE REACTIVITY AND IMPROVING THE FLOW BEHAVIOR OF PHOSPHORUS PENTOXIDE

Günther Schimmel, Erftstadt; Werner Kowalski, Weilerswist; Gero Heymer, and Reinhard Gradl, both of Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 14, 1986, Ser. No. 818,719

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1985, 3502705

Int. Cl.[4] C01B *25/12*

U.S. Cl. 23—293 R **5 Claims**

1. A process for subjecting phosphorus pentoxide to heat treatment which comprises annealing a phosphorus pentoxide feed product of the hexagonal modification at temperatures of 200° to 350° C. over a period of 0.5 to 8 hours resulting in the formation of a phosphorus pentoxide with a distinctly reduced reactivity and distinctly improved flow behavior, said phosphorus pentoxide obtained as a result of the annealing step being still in the form of its hexagonal modification as indicated by its Guinier diagram and having the particle size properties of the phosphorus pentoxide feed product.

4,705,530

REDUCTION OF SODIUM IN COAL BY WATER WASH AND ION EXCHANGE WITH A WEAK ELECTROLYTE

George C. Blytas, and Frank J. Trogus, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 779,718, Sep. 24, 1985, abandoned. This application Mar. 6, 1987, Ser. No. 22,474

Int. Cl.[4] C10L *9/02*

U.S. Cl. 44—1 R **5 Claims**

1. A process for upgrading coal comprising:

contacting coal with water having a relatively low concentration of ions, for dissolving water-soluble compounds containing sodium ions; and

contacting the water-washed coal with an aqueous solution of a weak acid, selected from the group consisting of carbonic, formic and acetic acid, for ion-exchanging protons from the acid solution for sodium ions from the coal.

4,705,531

REDUCTION OF SODIUM IN COAL BY WATER WASH FOLLOWED BY ION EXCHANGE WITHIN A PIPELINE

George C. Blytas, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 24, 1985, Ser. No. 779,717

Int. Cl.[4] C10L *9/02*

U.S. Cl. 44—1 R **10 Claims**

1. In a process for reducing the sodium concentration of coal by contacting the coal with an aqueous solution of strong electrolyte, an improvement comprising:

initially washing the coal with water which is substantially free of sodium ions, to remove water-soluble materials which contain sodium ions;

ion-exchanging the water-washed coal with an aqueous solution of strong electrolyte in which both the kinds and amounts of ions are correlated with the kinds and amounts of ion-exchangeable ions on the coal, so that said solution (a) is relatively free of sodium ions, (b) is sufficiently free of substances capable of forming atmospheric pollutants during an oxidation of coal so that the resultant total amount of those substances in the ion-exchanged coal is insufficient to cause significant pollution and (c) contains an amount of cations capable of exchanging with ion-exchangeable cations on the coal which amount is less than the stoichiometric amount of ion-exchangeable cations on the coal but is an amount which causes sodium ions to be selectively removed during the ion exchanging of the coal; and

conducting at least a significant proportion of said water-washing and/or ion-exchanging by flowing within a pipeline both a slurry of coal in aqueous liquid which is substantially free of sodium ions and a stream of fluid which comprises or contains at least one compound capable of forming an aqueous solution of electrolyte having the properties designated (a), (b) and (c) when mixed with the aqueous phase of said coal slurry.

3. The process of claim 1 in which an initial portion of the ion-exchange treatment is conducted by contacting the water-wet coal with an aqueous solution of strong electrolyte before conducting the ion exchange treatment within the pipeline.

4,705,532

ALCOHOL COMPOSITIONS FOR BLENDING WITH GASOLINE

Terry J. Mazanec; John G. Frye, Jr., both of Solon, and Harley F. Hardman, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 754,880, Jul. 15, 1985, abandoned. This application Jan. 30, 1987, Ser. No. 9,105
Int. Cl.[4] C10L *1/02*
U.S. Cl. 44—53 14 Claims

1. An alcohol composition suitable for mixing with gasoline comprising at least 30 percent by weight of methanal, the remainder of said composition comprising higher alcohols the distribution of which on a methanol-free basis is

C_2—about 10 to 90 weight percent,

C_3—greater than 25 to 60 weight percent,

C_4—about 0.5 to 35 weight percent,

and wherein the percent of C_3 is equal to or greater than 1.25 times the percent of C_4 and wherein the alcohol composition is prepared by a process which comprises contacting carbon monoxide and hydrogen under alcohol forming conditions at elevated temperature and pressure with a catalyst composition containing alkali or alkaline earth metal uranate of the formula $Cu_aUAl_bA_cO_x$ where

A is an alkali or alkaline earth metal;

a is from 0.01 to 5.0;

b is a number up to 5.0;

c is a number up to 5.0 selected so that the catalyst contains more than 2 percent by weight of metal A;

x is a number such that the valence requirements of the other elements for oxygen are satisfied.

4,705,533

UTILIZATION OF LOW RANK COAL AND PEAT

John J. Simmons, P.O. Box 1971, Bismarck, N. Dak. 58502

Filed Apr. 4, 1986, Ser. No. 848,166
Int. Cl.[4] C10L *1/32, 9/10*
U.S. Cl. 44—51 27 Claims

13. A composition including a fuel selected from the group consisting of an oil coated low rank coal and an oil coated peat, said fuel having a moisture content of less than about 5% by weight ground to a 75% minus 200 mesh and water, said composition comprising on a weight percent basis between about 44 to about 70% coal, from about 29 to about 55% water and from about 1 to about 5% oil.

14. The composition of claim 13 wherein said low rank coal is selected from the group consisting of sub-bituminous, lignite and brown coal.

15. The composition of claim 13 further including a suspension stabilizing agent.

16. The composition of claim 14 wherein said suspension stabilizing agent is selected from the group consisting of starch graft polymers, anionic surfactants, alkyl phosphates, alkyl sulfates and alkane sulfuric acids.

4,705,534

CETANE NUMBER OF DIESEL FUEL BY INCORPORATING POLYNITRATE ESTERS AND STABILIZERS

Tsoung Y. Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 15, 1985, Ser. No. 798,517
Int. Cl.[4] C10L *1/18, 1/22*
U.S. Cl. 44—57 17 Claims

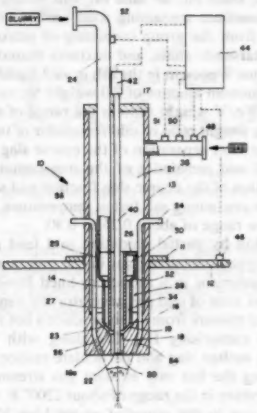
1. A liquid fuel composition adapted for use in a diesel engine, comprising diesel fuel boiling within the range of 200°–850° F. containing a cetane number-increasing amount of a mixture of fuel-soluble polynitrate esters and a stabilizer selected from the group consisting of diphenyl amine, diethyl diphenylurea and 2-dinitrodiphenylamine.

4,705,535

NOZZLE FOR ACHIEVING CONSTANT MIXING ENERGY

Charles W. Lipp, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 13, 1986, Ser. No. 839,252
Int. Cl.[4] C10J *3/68*
U.S. Cl. 48—77 14 Claims



1. The combination of a vessel and an apparatus for the discharge of an atomized liquid and gas dispersion into said vessel, said apparatus comprising:

(a) a first conduit in liquid communication with a liquid source and a second conduit in gas communication with a gas source;

(b) an adjustable two-fluid nozzle which provides a substantially constant mixing energy for effecting the atomization of said liquid and which is in liquid and gas communication, respectfully, with said first and second conduits;

(c) first pressure sensing means for measuring the gas pressure in said vessel and for providing an output indicative of the measurement;

(d) second pressure sensing means for measuring the gas pressure of the gas entering said two-fluid nozzle and for providing an output indicative of the measurement;

(e) first flow rate sensing means for measuring the mass of liquid communicated to said two-fluid nozzle and for providing an output indicative of the measurement; and

(f) second flow rate sensing means for measuring the mass of gas communicated to said two-fluid nozzle and for providing an output indicative of the measurement.

4,705,536

PARTIAL OXIDATION OF VANADIUM-CONTAINING HEAVY LIQUID HYDROCARBONACEOUS AND SOLID CARBONACEOUS FUELS

Michael W. Becker, Los Alamitos; John S. Stevenson, Gardena, both of Calif., and Mitri S. Najjar, Hopewell Junction, N.Y., assignors to Texaco, Inc., White Plains, N.Y.

Filed Sep. 2, 1986, Ser. No. 902,838
Int. Cl.[4] C10J *3/46*
U.S. Cl. 48—197 R 26 Claims

1. In a partial oxidation process for the production of gaseous mixtures comprising H_2+CO in the reaction zone of a down flowing gas generator, the improvement comprising:

(1) mixing together the following materials to produce a feed mixture, (i) a vanadium-containing fuel selected from the group consisting of liquid hydrocarbonaceous fuel, a slurry of solid carbonaceous fuel, and mixtures, thereof; (ii) supplemental iron-containing ash fusion temperature

reducing agent containing iron compounds selected from the group consisting of oxides, sulfides, sulfates, carbonates, cyanides, nitrates and mixtures thereof; and (iii) at least a portion of the remainder of the iron-containing slag after separation of the coarse slag fraction in (5); wherein said vanadium-containing liquid hydrocarbonaceous fuel is a petroleum derived liquid fuel selected from the group consisting of whole crude, residua from petroleum distillation and cracking, petroleum distillate, reduced crude, asphalt, shale oil, tar sand oil, and mixtures thereof; and said vanadium containing solid carbonaceous fuel is selected from the group consisting of petroleum coke, asphalt, tarsands, shale, and mixtures thereof; and wherein vanadium is present in the ash in said liquid and solid fuels in a minimum amount of 2.0 weight %; said feed mixture has an Fe/V weight ratio in the range of about 5.0 to 50; and the weight ratio of said remainder of the iron-containing slag after separation of the coarse slag fraction to the sum of said remainder of the iron-containing slag after separation of the coarse slag fraction and said supplemental iron-containing ash fusion temperature reducing agent is in the range of about 0.25 to 0.90;

(2) reacting by partial oxidation said feed mixture with a free-oxygen containing gas in the presence of a temperature moderator in a refractory-lined free-flow unpacked reaction zone of said gas generator the vanadium-containing feed mixture from (1) to produce a hot raw effluent gas stream comprising H_2+CO along with vanadium-containing molten slag and particulate matter;

(3) passing the hot raw effluent gas stream from (2) at a temperature in the range of about 2200° F. to 3000° F. and a pressure in the range of about 1 to 300 atmospheres down through a coaxial discharge passage in the bottom of the reaction zone of said gas generator and then into a connecting refractory-lined slag separation chamber that is provided with a bottom outlet; depositing a portion of the slag entrained in said hot raw gas stream on the walls of said separation chamber and building up the thickness of said slag on the walls of said chamber until chunks of slag having a diameter in the range of about ¼ inch to 10 inches and an Fe/V weight ratio which is less than that of the feed mixture in (1) separate from the wall and fall into quench water contained in a quench tank located below the bottom outlet in said separation chamber; wherein the temperature of the refractory walls of the slag separation chamber is lower than that of the hot raw effluent gas stream, the dwell time in the slag separation chamber is in the range of about 0.05 to 0.5 seconds, and from about 1.0 to 25.0 wt. % of the molten slag entrained in the hot raw gas stream separates out in the slag separation chamber;

(4) passing through said quench tank at least a portion of the hot effluent gas stream leaving said slag separation chamber and containing entrained molten slag to produce said gaseous mixture comprising H_2+CO, and solidifying molten slag and separating out in said quench tank slag and particulate matter that were entrained in said hot raw gas stream; wherein the Fe/V weight ratio of the slag entrained in the effluent gas stream leaving said slag separation chamber is greater than and the particle size is smaller than that of the slag which builds up on the walls of said slag separation chamber and falls into the quench tank; and

(5) passing the water and solids from the bottom of said quench tank into a water-solids separation zone; removing a portion of the water from said vessel and recycling said water to the quench tank; and separating a coarse iron-containing slag fraction from the remainder of the slag having a smaller particle size wherein said coarse slag fraction has an Fe/V weight ratio which is about 40% to 70% less than that of the feed mixture in (1), and the remainder of the slag after separation of the coarse slag fraction has an Fe/V weight ratio in a range about equal to that of the feed mixture in (1) to 250% greater than that of the feed mixture in (1).

4,705,537

PROCESS FOR SEPARATING CLARIFIED WATER FROM AN AQUEOUS DISPERSION OF ASH, SLAG AND CHAR PARTICULATE MATTER

Farrokh Yaghmaie; Mitri S. Najjar, both of Hopewell Junction, and Louis S. Sorell, Carmel, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 2, 1985, Ser. No. 803,689

The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.

Int. Cl.[4] C02F 1/54

U.S. Cl. 48—197 R **11 Claims**

1. In a process for reacting a feedstock comprising an ash-containing solid carbonaceous fuel selected from the group consisting of anthracite coal, bituminous coal, sub-bituminous coal, lignite, particulate carbon, coke from coal, petroleum coke, oil shale, tar sands, asphalt, pitch, and mixtures thereof with a free-oxygen containing gas in a free-flow partial oxidation gas generator to produce a hot raw effluent gas stream comprising H_2, CO, other gaseous material, and entrained particulate solids selected from the group consisting of ash, slag, char and mixtures thereof, and having a particle size in the range of about 2000 to about 37 microns; the improvement comprising:

(1) cooling and scrubbing said hot raw effluent gas stream from the gas generator with water in a gas cooling and scrubbing zone, thereby removing said entrained particulate solids from the effluent gas stream and producing a water dispersion of particulate solids;

(2) mixing with said water dispersion of particulate solids an anionic surfactant comprising a sulfonated product of humic acids and their salts, and sufficient acid to provide said mixture with a pH in the range of about 2 to 6; wherein said surfactant is added in the amount of about 0.01 to 5.0 wt. % basis weight of said particulate solids in said water dispersion, and is sufficient to decrease the hydrophobicity of the particles whereby the wettability of said particulate solids is increased to aid in the settling; and settling said particulate solids; and wherein said anionic surfactant is prepared by grinding organic material bearing humic acids and selected from the group consisting of peat, lignite, sub-bituminous, bituminous and anthracite coals to at least 60 mesh size, neutralizing said humic acids with a base to form a reaction mixture, and contacting said reaction mixture with sulfur dioxide under sulfonation conditions until a substantial part of the humic acids contents of said reaction mixture is sulfonated to form said surfactant;

(3) separating a clarified stream of water substantially free from said particulate solids in a solids-liquid separating zone, and concentrated aqueous dispersion of said particulate solids; and

(4) recycling at least a portion of said clarified water to said gas cooling and scrubbing zone.

4,705,538

PARTIAL OXIDATION PROCESS

Mitri S. Najjar, Hopewell Junction, and Richard V. Kessler, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 4, 1985, Ser. No. 795,015

The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.

Int. Cl.[4] C10J 3/46

U.S. Cl. 48—197 R **26 Claims**

1. A process for the production of gaseous mixtures comprising H_2+CO comprising:

(1) mixing together (i) an ash fusion temperature increasing agent comprising a comminuted material selected from the group consisting of silicon compound, titanium compound, and mixtures thereof with (ii) and ash-containing fuel feedstock comprising a liquid hydrocarbonaceous material and/or ash-containing petroleum coke, wherein

the ash in said feedstock includes vanadium, and wherein the weight ratio of said ash fusion temperature increasing agent to the ash in said ash-containing fuel is in the range of about 0.5 to 10;

(2) reacting said mixture from step (1) in a free-flow partial oxidation reaction zone at a temperature in the range of about 2100° F. to 2700° F. and a pressure in the range of about 1 to 200 atmospheres with a free-oxygen containing gas in the presence of a temperature moderator to produce a hot raw effluent gas stream comprising H_2+CO along with fly-ash having an increased initial deformation temperature; and

(3) separating said fly-ash from said hot raw effluent gas stream.

4,705,539

PARTIAL OXIDATION PROCESS

Mitri S. Najjar, Hopewell Junction, N.Y.; Michael W. Becker, Long Beach, Calif., and Arnulf Muan, State College, Pa., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 2, 1985, Ser. No. 803,688

The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.

Int. Cl.[4] C10J *3/46*

U.S. Cl. 48—197 R **29 Claims**

1. A process for the production of gaseous mixtures comprising H_2+CO comprising:

(1) mixing together (i) an ash fusion temperature reducing agent comprising about 50.0 wt. %, or more of a manganese compound, and any remainder of said agent comprising a silicon compound with (ii) an ash-containing fuel feedstock comprising a liquid hydrocarbonaceous material and/or ash-containing petroleum coke; wherein the ash in said feedstock includes vanadium, and wherein the weight ratio of said ash fusion temperature reducing agent to the ash in said ash-containing fuel is in the range of about 0.5 to 10;

(2) reacting said mixture from step (1) in a free-flow partial oxidation reaction zone at a temperature in the range of about 2100° F., to 2700° F., and a pressure in the range of about 1 to 200 atmospheres with a free-oxygen containing gas in the presence of a temperature moderator to produce a hot raw effluent gas stream comprising H_2+CO along with molten ash having a reduced initial deformation temperature; and

(3) separating said molten ash from said hot raw effluent gas stream.

4,705,540

POLYIMIDE GAS SEPARATION MEMBRANES

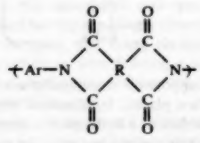
Richard A. Hayes, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 17, 1986, Ser. No. 853,341

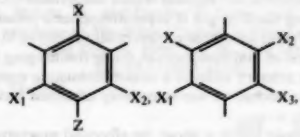
Int. Cl.[4] B01D *53/22*

U.S. Cl. 55—16 **6 Claims**

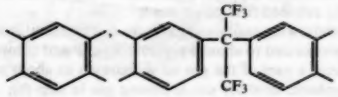
1. A gas separation membrane formed of an aromatic polyimide of the formula



where —Ar— is

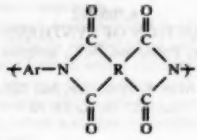


or mixture thereof, and R is

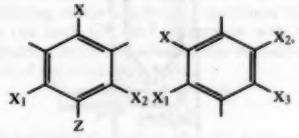


or mixtures thereof and —X, $-X_1$, $-X_2$, and $-X_3$ are independently alkyl groups having 1 to 6 carbon atoms or aromatic groups having 6 to 13 carbon atoms, and —Z is —H, —X, $-X_1$, $-X_2$, or $-X_3$.

4. A process of separating two or more gases comprising of steps of bringing a mixture of two or more gases into contact with one side of a permselective membrane which is formed from an aromatic polyimide of the formula

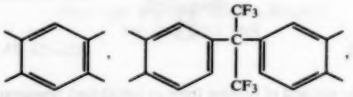


where —Ar— is



or

or mixtures thereof, and R′ is



or mixtures thereof and —X, $-X_1$, $-X_2$, and $-X_3$ are independently alkyl groups of 1 to 6 carbon atoms, or aromatic group having 6 to 13 carbon atoms and —Z is —H, —X, $-X_1$, $-X_2$, or $-X_3$ whereby one of said gases permeates said membrane at a different productivity rate than at least one other gas.

4,705,541

PRODUCTION OF MIXED GASES OF CONTROLLED COMPOSITION BY PRESSURE SWING ADSORPTION

Shivaji Sircar, Wescosville, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 12, 1987, Ser. No. 13,754

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—26 **10 Claims**

1. In the production of a binary gas mixture of desired fixed

proportions of components from a starting feed gas containing such components, the method which comprisees the steps of

(a) passing the feed gas at superatmospheric pressure into a bed of solid adsorbent preferentially selective in retention of a first of said components, while discharging from said bed as primary effluent a stream consisting essentially of the unadsorbed or less selectively adsorbed second component;

(b) while said bed is at about the aforesaid superatmospheric pressure, discontinuing said feed gas introduction and rinsing the bed, in a direction co-current to that of the feed gas introduction, with a gas stream rich in said preferentially retained first component;

(c) withdrawing contained gas from said bed until said bed is depressurized to about a pressure level P and compressing at least a part of the gas so withdrawn to about superatmospheric level for use as rinsing gas in step (b);

(d) while at about said pressure level of P, purging the bed with a controlled amount of the gas discharged as primary effluent during step (a), thereby producing a purge effluent as the binary gas mixture of desired fixed proportions of components; and thereafter

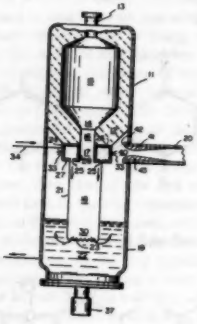
(e) repressuring the bed to the initial superatmospheric pressure level of step (a) for repetition of the recited sequence of steps, said repressuring being effected with part of the primary effluent from step (a).

4,705,542

PRODUCTION OF SYNTHESIS GAS

William N. Gilmer, Patterson, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 1, 1984, Ser. No. 585,055
Int. Cl.[4] B01D *53/14*
U.S. Cl. 55—93 **12 Claims**



1. The method of cooling from an initial high temperature to a lower final temperature, a hot synthesis gas containing solids under conditions which permit removal of solids from said gas which comprises

passing said hot synthesis gas at initial high temperature downwardly through a first contacting zone;

passing cooling liquid downwardly as a film on the walls of said first contacting zone and in contact with said downwardly descending synthesis gas thereby cooling said synthesis gas and forming a cooled synthesis gas;

passing said synthesis gas into a body of aqueous cooling liquid in a second contacting zone thereby forming a further cooled synthesis gas containing a decreased content of solid particles;

recovering said further cooled synthesis gas containing a decreased content of solid particles;

passing said further cooled synthesis gas containing a decreased content of solid particles in streamline flow in a discharge conduit whereby the deposition of solid particles in said conduit is decreased; and

withdrawing said synthesis gas containing a decreased content of solid particles from said discharge conduit.

4,705,543

FLUID DRYING TUBE

Jack Kertzman, Oceanport, N.J., assignor to Perma Pure Products, Inc., Toms River, N.J.

Filed Sep. 19, 1986, Ser. No. 909,694
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—158 **13 Claims**

1. A fluid drying device comprising a section of tubing formed of a first material having selective and reversible water-absorption properties, the surface of said tubing covered with a braided netting of a second material, and means for connecting said tubing to receive fluid.

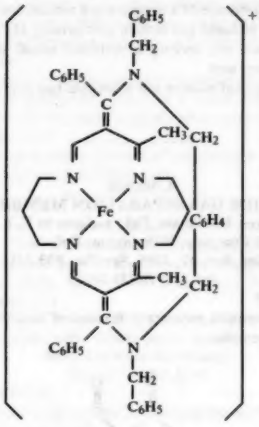
4,705,544

LIQUID MEMBRANE

Koichi Okita; Shinichi Toyooka; Shigeru Asako, and Katsuya Yamada, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Nov. 26, 1985, Ser. No. 801,723
Claims priority, application Japan, Dec. 24, 1984, 59-279348
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—158 **15 Claims**

1. A liquid membrane comprising a solvent, an active species capable of performing facilitated transport of a specific gas, and a support for maintaining a liquid mixture of said solvent and said active species, wherein said active species has the structure represented by the following formula:



and wherein said support for maintaining a mixture comprises a hydrophilic surface placed, by chemical means, on a physically roughened surface of a hydrophobic support, said hydrophilic surface then being contacted with the mixture of solvent and active species to be retained thereby.

4,705,545

THIN FILM POLYMER BLEND MEMBRANES

Anthony J. Polak, Lake Zurich, and Sandra Petty-Weeks, Naperville, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 617,054, Jun. 1, 1984, abandoned. This application Aug. 13, 1985, Ser. No. 765,097
The portion of the term of this patent subsequent to Sep. 2, 2003, has been disclaimed.
Int. Cl.[4] B01D *13/00*
U.S. Cl. 55—158 19 Claims

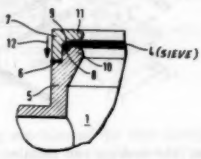
1. A macroscopically homogeneous thin film polymer blend gas-separation membrane which comprises a solution blend comprising (1) an acid present in an amount in the range of from 1% to 70% by weight of said blend selected from the group consisting of phosphoric acids and sulfuric acid and (2) a component present in an amount in the range of from 30% to 99% by weight of said blend selected from the group consisting of (i) a polymer selected from the group consisting of polyvinyl alcohol, polyvinyl fluoride, polyethyleneimine, polyacrylic acid, polyethylene glycol, cellulose acetate, phenol formaldehyde resins, polyvinyl pyrrolidone, polyethyloxazoline, polyacrylamide, poly(N-isopropyl acrylamide), poly(N,N-dimethyl acrylamide), poly(vinyl 4-pyridiene) and poly(vinyl sulfonic acid); (ii) copolymers having monomer units of the polymers of (i); and (iii) a polymer or copolymer having repeat units selected from the group consisting of 4-pyridylethylene and N-pyrrolidonylethylene wherein said membrane possesses a thickness in the range of from about 0.1 to about 100 microns.

4,705,546

FUEL COLLECTION IN SURFACE TENSION FUEL TANKS

Helmut Bruns, Kirchweyhe; Artur Freiheit, Stuhr, and Arnold Kolley, Ganderkesee, all of Fed. Rep. of Germany, assignors to Erno Raunfahrttechnik GmbH, Bremen, Fed. Rep. of Germany

Filed May 28, 1986, Ser. No. 868,266
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1985, 3520676
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—182 3 Claims



1. Fuel collecting container for use in conjunction with a surface tension fuel tank of a space vehicle; the container being made of Ti and having a fuel inlet and fuel outlet, comprising:

a flat cylindrical-tubular element having an open end with a chamfered edge;

a Ti clamping ring mounted to said open end of said tubular container and having a matingly chamfered internal shoulder, said clamping ring being electron beam welded to said container in an area defining a gap between an axial end of the clamping ring and an outer shoulder portion of the container tube; and

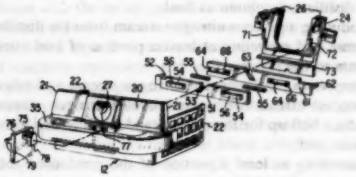
a sieve covering the open end of the container and being clamped in between said chamfered shoulder and said chamferred edge.

4,705,547

DIRT DRAWER LATCH FOR VACUUM CLEANER

Louis A. Rotola, Jr., and Gordon E. Laing, both of Anderson, S.C., assignors to The Singer Company, Stamford, Conn.

Filed Sep. 29, 1986, Ser. No. 912,741
Int. Cl.[4] B01D *46/02*
U.S. Cl. 55—374 3 Claims



1. In a vacuum cleaner having a body formed with a tray accommodating opening; a motor blower unit associated with said housing for creating a vacuum therein; and a tray insertable into said housing through said tray accommodating opening; said tray including inlet means for supporting a disposable filter bag thereon, a front wall adapted to close said tray accommodating opening in said housing when said tray is inserted completely into said housing, and latch means for releasably restraining said tray completely inserted into said housing; the improvement comprising:

a plurality of latch bolts included in said latch means, each latch bolt shiftably supported on said tray;

said body being formed with a plurality of latch bolt accommodating recesses spaced from each other and arranged each in registry with a different one of said plurality of latch bolts when said tray is inserted completely within said body; and

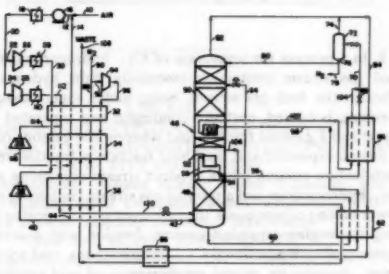
interlock means operationally interconnecting all of said latch bolts for shifting movement in unison between positions into and out of engagement with said respective registering recesses, whereby impedance of the shift of any one latch bolt into engagement with its respective registering recess will effect similar impedance of the shift of all of the other latch bolts.

4,705,548

LIQUID PRODUCTS USING AN AIR AND A NITROGEN RECYCLE LIQUEFIER

Rakesh Agrawal, Allentown, and Steven R. Auvil, Macungie, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 25, 1986, Ser. No. 856,087
Int. Cl.[4] F25J *3/04*
U.S. Cl. 62—22 19 Claims



1. In a process for the cryogenic distillative separation of air by fractionation in a distillation column to produce at least one

liquid product stream selected from the group consisting of liquid nitrogen, liquid oxygen and/or liquid argon, the improvement comprising:

(a) cooling a feed air stream by appropriate refrigeration to produce at least a portion of the feed air stream as a liquid air stream;

(b) introducing at least a portion of the liquid air stream to the distillation column as feed;

(c) producing a gaseous nitrogen stream from the distillation column and recycling at least a portion of said nitrogen stream to the process;

(d) compressing the recycled nitrogen stream and reboiling a process stream with the recycle nitrogen stream to produce boil-up for the process and a condensed nitrogen stream, and

(e) recovering at least a portion of the condensed recycle nitrogen as liquid nitrogen product.

4,705,549

SEPARATION OF C_{3+} HYDROCARBONS BY ABSORPTION AND RECTIFICATION

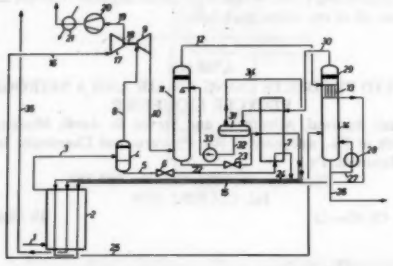
Rainer Sapper, Neuried, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 17, 1985, Ser. No. 809,953

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1984, 3445961

Int. Cl.[4] F25J *3/02*

U.S. Cl. 62—30 **22 Claims**



1. In a process for separation of C_{3+} hydrocarbons from a feed gas stream containing essentially light hydrocarbons, wherein the feed gas stream, being under superatmospheric pressure, is cooled, partially condensed and separated into a liquid and a gaseous fraction and wherein the gaseous fraction is engine expanded and the liquid fraction is fractionated in a rectification column into a product stream containing mostly C_{3+} hydrocarbons and a residual gas stream containing mostly lower boiling components, the improvement comprising scrubbing the engine expanded gaseous fraction with a scrubbing agent to absorb additional C_{3+} hydrocarbons, said scrubbing agent obtained by partial condensation of said residual gas stream from the rectification column, and said scrubbing being conducted at a pressure substantially higher than that of the rectification step.

4,705,550

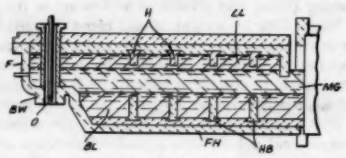
PROCESS FOR PROVIDING A THERMICALLY HOMOGENEOUS FLOW OF MOLTEN GLASS

Enrique Canales-Santos, Garza Garcia; Guillermo Carro-de-la-Fuente, Ciudad Guadalupe, and Saul R. Ruiz-Ontiveros, Garza Garcia, all of Mexico, assignors to Vitro Tec Fideicomiso, Monterrey, Mexico

Filed Feb. 13, 1986, Ser. No. 829,272

Int. Cl.[4] C03B *5/26, 5/08*

U.S. Cl. 65—32 **8 Claims**



1. A process of forming a thermally homogenous flow of molten glass in the forehearth of a glass feeder, comprising:

feeding molten glass to said forehearth;

heating said molten glass within said forehearth to maintain it in said molten state and permitting said molten glass to stabilize while within said forehearth; and

providing a continuous layer within said forehearth of dissimilar stratified molten metal materials, each of lesser density than said molten glass, and each of lower melting temperature than the temperature of said molten glass.

4,705,551

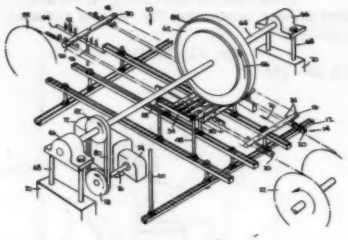
TEST TUBE MAKING AND END COATING

E. Howell Robinson, Jr., Harriman, Tenn., assignor to Chase Instruments Corporation, Glens Falls, N.Y.

Filed Aug. 22, 1986, Ser. No. 899,485

Int. Cl.[4] C03B *23/11*

U.S. Cl. 65—60.1 **6 Claims**



1. A test tube making and painting machine, comprising:

a. a conveyor for glass tubes which are open at both ends,

b. said conveyor being adapted to support said open-ended tubes in horizontal side-by-side, parallel relation to each other and to convey them in a path transverse their longitudinal axes,

c. said conveyor having tube-engaging means engageable with the individual open-ended tubes at locations spaced from their open end and center portions,

d. paint applying means supported adjacent the path of the conveyor for applying label paint to said open end portions of the open-ended tubes,

e. tube rotating means engageable with said open-ended tubes to rotate them about their longitudinal axes relative to the paint applying means,

f. whereby label paint is applied to the open-ended tubes to form tube-encircling painted labeling bands, and

e. glass fusing means supported adjacent the path of the conveyor for application to the center portions of said rotating open-ended tubes,

h. whereby each open-ended tube is centrally fused and severed to form two separate test tubes which are closed at their fused end and open at their painted end.

6. A method of making and painting test tubes, comprising the steps of:

a. supporting open-ended glass tubes in horizontal, side-by-side relationship, their longitudinal axes parallel to each other,

b. conveying said glass tubes in a path transverse their longitudinal axes,

c. rotating said glass tubes about their longitudinal axes,

d. applying label paint to said glass tubes adjacent their open ends while rotating said glass tubes,

e. thereby forming tube-encircling painted labeling bands on said glass tubes adjacent their open ends,

f. fusing said glass tubes at their center portions while rotating said glass tubes,

g. thereby severing said glass tubes at their center portions and closing the severed ends to form two separate test tubes from each glass tube,

h. each said individual test tube being closed at one end and provided at its open end with a painted labeling band.

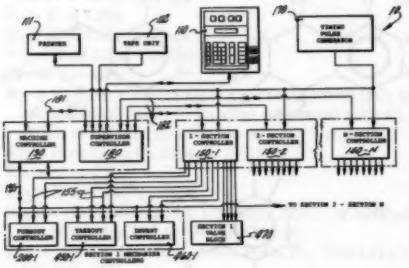
4,705,552
GLASSWARE FORMING APPARATUS WITH DISTRIBUTED CONTROL

Timothy J. Liska, West Simsbury, and Paul F. Scott, Granby, both of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Continuation of Ser. No. 775,454, Sep. 12, 1985, abandoned. This application Oct. 21, 1986, Ser. No. 921,554

Int. Cl.⁴ C03B 9/40

U.S. Cl. 65—158 **14 Claims**



1. In a glassware forming machine of the type including a plurality of machine sections each having a set of machine components for receiving gobs of molten glass and molding the glass into glassware articles, said sections operating in phased relationship within cycles of operation,

an electronic control system for controlling the operation of said machine components comprising:

a section controller, for generating a series of timing signals for at least one section to define actuation and deactuation times within the machine cycle;

a machine controller for providing set-up parameters representative of operational set-up information for at least one of said machine components;

at least one mechanism controller for a given machine section, for controlling the operation of a given machine component thereof, said mechanism controller containing:

a control program for that component;

a processor;

timing input port means for receiving the timing signals from said section controller;

set-up input port means for receiving the set-up signals from said machine controller;

and input interface means for providing actuating signals to at least one machine component, wherein said control program processes said timing signals in accordance with the set-up parameters to produce at least one control signal for the machine component;

a bidirectional asynchronous communications link between said machine controller and said mechanism controller, for passing set-up parameter signals from said machine controller to said mechanism controller, and for passing alarm signals from said mechanism controller to said machine controller (1) to signal alarm conditions identified by said control program or (2) to cause said machine controller to download said setup parameters.

4,705,553
METHOD OF REDUCING PLANT GROWTH HEIGHT USING PHENYLALKYLMORPHOLINES

Ernst Buschmann, Ludwigshafen; Walter Himmele, Walldorf; Heinz Eckhardt; Hansgeorg Ernst, both of Ludwigshafen; Wilhelm Rademacher, and Johann Jung, both of Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

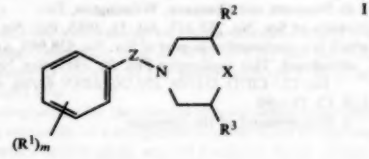
Division of Ser. No. 743,683, Jun. 11, 1985, abandoned. This application Feb. 13, 1987, Ser. No. 15,542

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1984, 3421810

Int. Cl.⁴ A01N 43/84

U.S. Cl. 71—76 **1 Claim**

1. A method of reducing the growth height in plants, which comprises allowing an effective amount of phenylalkylamine of the formula



I

where the radical R^1 is selected from the group consisting of lower alkyl, R^2 and R^3 are C_1–C_3-alkyl, z is a straight-chain C_4–C_{10}-alkylene which is unsubstituted or substituted by not more than three C_1–C_4-alkyl radicals, X is oxygen, and m is 1, to act on plants or on their propagation stock.

4,705,554
BENZOFURANYLOXYPHENYLUREA DERIVATIVE AND HERBICIDAL COMPOSITION CONTAINING IT AS AN ACTIVE INGREDIENT

Susumu Matsumoto; Shigeru Suzuki; Hisao Watanabe, and Hiroshi Hanabe, all of Yokohama, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

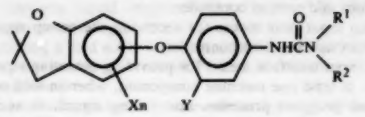
Filed Nov. 14, 1986, Ser. No. 930,451

Claims priority, application Japan, Dec. 3, 1985, 60-272091

Int. Cl.⁴ A01N 47/30; C07D 307/86, 307/79

U.S. Cl. 71—88 **14 Claims**

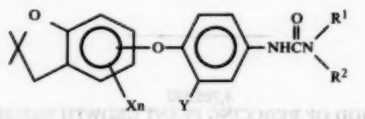
1. A benzofuranyloxyphenylurea derivative having the formula:



(I)

wherein X is a halogen atom or a trifluoromethyl group, n is an integer of from 0 to 2, Y is a hydrogen atom, a halogen atom or a trifluoromethyl group, R^1 is a lower alkyl group, and R^2 is a lower alkyl group, a lower alkenyl group a lower alkynyl group or a lower alkoxy group.

8. A herbicidal composition comprising a herbicidally effective amount of the benzofuranyloxyphenylurea derivative having the formula:



(I)

wherein X is a halogen atom or a trifluoromethyl group, n is an integer of from 0 to 2, Y is a hydrogen atom, a halogen atom or a trifluoromethyl group, R^1 is a lower alkyl group, and R^2 is a lower alkyl group, a lower alkenyl group, a lower alkynyl group or a lower alkoxy group, as an active ingredient and an inert carrier.

4,705,555

HERBICIDAL TRIAZINES

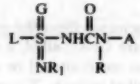
Craig L. Hillemann, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 753,117, Jul. 11, 1985, Pat. No. 4,666,506, which is a continuation-in-part of Ser. No. 638,963, Aug. 8, 1984, abandoned. This application Feb. 20, 1987, Ser. No. 17,334

Int. Cl.[4] **C07D** *251/46, 251/20;* **A01N** *43/66, 43/70*

U.S. Cl. 71—90 **42 Claims**

1. A compound of the formula:



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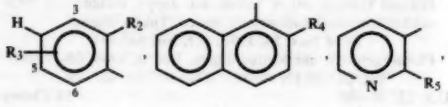
wherein

R is H or CH_3;

G is O or NR_1;

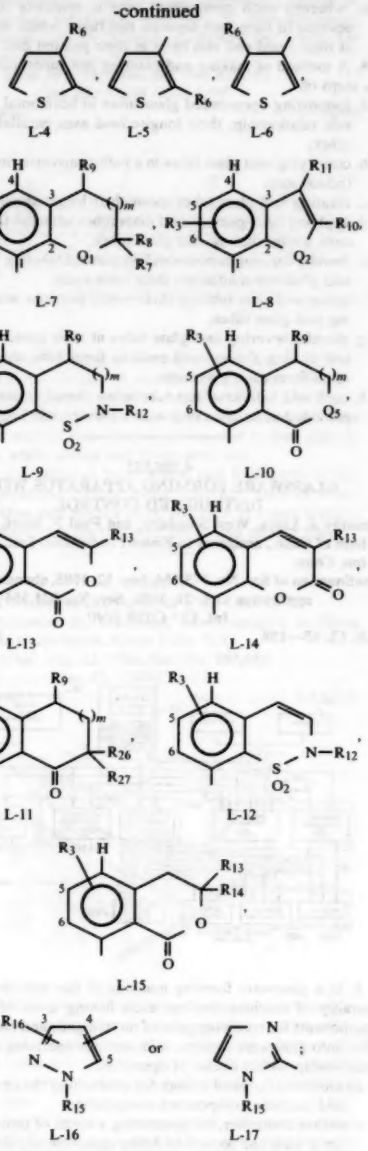
R_1 is H, C_1 to C_3 alkyl, CF_2H, C_2 to C_3 alkyl substituted with 1 to 3 atoms of F, $CH_2CH_2OCH_3$, CH_2CH_2OH, $CH_2CH_2OSi(CH_3)_3$, OH, $OSi(CH_3)_3$, C_1 to C_2 alkoxy, SO_2CH_3, phenyl or benzyl;

L is



L-1 L-2 L-3

-continued



L-4 L-5 L-6

L-7 L-8

L-9 L-10

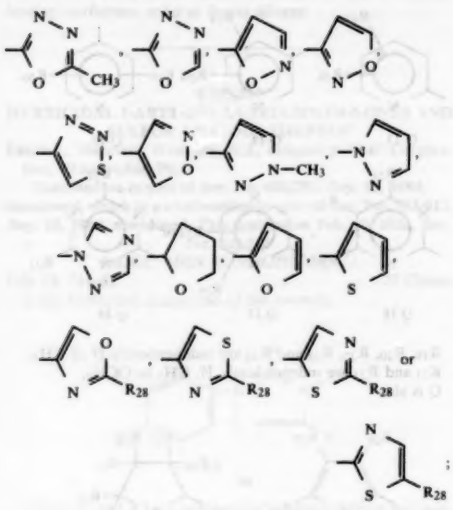
L-13 L-14

L-11 L-12

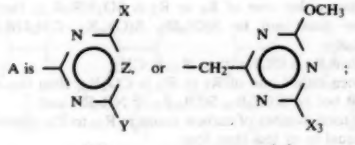
L-15

L-16 or L-17

R_2 is C_1 to C_4 alkyl, C_1 to C_4 alkoxy, $OCH_2CH_2OCH_3$, F, Cl, Br, C_1 to C_2 haloalkoxy, C_1 to C_2 haloalkylthio, C_1 to C_2 haloalkylsulfonyl, C_2 to C_3 alkylcarbonyl, NO_2, CO_2R_{17}, $SO_2NR_{18}R_{19}$, $SO_2N(OCH_3)CH_3$, OSO_2R_{20}, $S(O)_pR_{21}$, C_3 to C_4 alkenyloxy, C_3 to C_4 alkynyloxy, C_1 to C_2 alkyl substituted with OCH_3, OCH_2CH_3, 1 to 3 atoms of F or Cl, or with 1 Br, C_2 to C_3 alkenyl optionally substituted with 1 to 3F or Cl, C_6H_5,

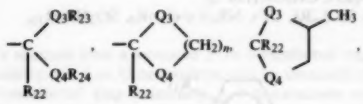


R_3 is H, F, Cl, Br, CF_3, CH_3, CH_2CH_3, OCH_3, OCF_2H, OC_2H_5, C_1 to C_2 alkylthio, CH_2SCH_3, CH_2OCH_3 or C_1 to C_2 alkoxy substituted with 1 to 3F;
R_4 is H, CH_3, OCH_3, F, Cl, Br, $SO_2N(CH_3)_2$, OSO_2CH_3 or SO_2CH_3;
R_5 is CH_3, CH_2CH_3, OCH_3, OCH_2CH_3, F, Cl, Br, $SO_2NR_{18}R_{19}$, $SO_2N(OCH_3)CH_3$ or SO_2R_{21};
R_6 is F, Cl, Br, NO_2, CO_2R_{17}, $SO_2NR_{18}R_{19}$, $SO_2N(OCH_3)CH_3$ or SO_2R_{21};
R_7 is H or C_1 to C_4 alkyl;
R_8 is H or CH_3;
R_9 is H or CH_3;
R_{10} is H or C_1 to C_4 alkyl;
R_{11} is H or CH_3;
R_{12} is H, C_1 to C_6 alkyl, C_2 to C_3 alkoxycarbonyl, C_2 to C_3 alkylcarbonyl or C_2 to C_4 alkyl substituted with Cl, Br, OCH_3 or OC_2H_5, or with 1 to 3F;
R_{13} is H or C_1 to C_3 alkyl;
R_{14} is H or CH_3;
R_{15} is H or C_1 to C_3 alkyl;
R_{16} is C_1 to C_3 alkyl, F, Cl, Br, NO_2, CO_2R_{17}, $SO_2NR_{18}R_{19}$, $SO_2N(OCH_3)CH_3$, SO_2R_{21} or OCF_2H;
R_{17} is C_1 to C_4 alkyl, $CH_2CH_2OCH_3$, CH_2CH_2Cl or $CH_2CH{=}CH_2$;
R_{18} is C_1 to C_3 alkyl;
R_{19} is C_1 to C_3 alkyl;
R_{20} is C_1 to C_3 alkyl or $N(CH_3)_2$;
R_{21} is C_1 to C_3 alkyl or $CH_2CH{=}CH_2$;
m is 0 or 1;
p is 0, 1 or 2;
Q_1 is O or SO_2;
Q_2 is O or S;

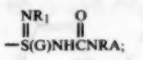


A-1 A-6

X is CH_3, OCH_3, OCH_2CH_3, CH_2F, OCH_2CH_2F, OCH_2CHF_2, OCH_2CF_3 or CF_3;
Y is H, CH_3, OCH_3, OC_2H_5, CH_2OCH_3, $CH_2OCH_2CH_3$, $NHCH_3$, $N(OCH_3)CH_3$, $N(CH_3)_2$, C_2H_5, CF_3, SCH_3, $OCH_2C{\equiv}CH$, amino, $CH_2S(O)CH_3$, $CH_2SO_2CH_3$, $C{\equiv}CH$, $C{\equiv}CCH_3$, $OCH_2CH{=}CH_2$, $OCH_2CH_2OCH_3$, CH_2SCH_3,



SCF_2H or cyclopropyl;
n is 2 or 3;
Q_3 and Q_4 are independently O or S;
Q_5 is O or NR_{25};
R_{22} is H or CH_3;
R_{23} and R_{24} are independently C_1 to C_2 alkyl;
R_{25} is H or C_1 to C_3 alkyl;
R_{26} is H or Cl;
R_{27} is H or Cl;
R_{28} is H or CH_3;
Z is N;
X_3 is CH_3 or OCH_3;
and their agriculturally suitable salts; provided that
(a) when m is 1, then R_9 is H;
(b) the total number of carbon atoms of R_{18} and R_{19} does not exceed four;
(c) when L is L-15, then R_{13} and R_{14} are not simultaneously H;
(d) when L is L-16, then R_{16} is adjacent to the substituent



and
(e) when the total number of carbon atoms of X and Y is greater than four, then R_1 is H or CH_3 and the total number of carbons of the substituents on L does not exceed four.

15. A composition for the control of undesirable vegetation consisting essentially of a compound of claim **1** and at least one of (a) a surface active agent, and (b) a solid or liquid diluent.

4,705,556

HERBICIDAL SULFONAMIDES

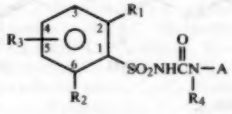
Mary A. Hanagan, Blue Bell, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 628,259, Jul. 12, 1984, Pat. No. 4,604,131, which is a continuation-in-part of Ser. No. 520,801, Aug. 5, 1983, abandoned. This application Mar. 18, 1986, Ser. No. 841,109

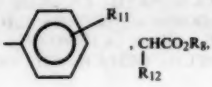
Int. Cl.[4] **A01N** *43/54, 43/66;* **C07D** *251/16, 403/12*

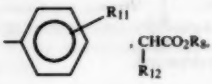
U.S. Cl. 71—90 **3 Claims**

1. A compound of the formula:



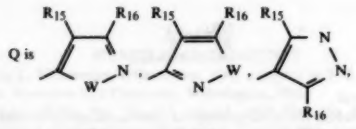
wherein
R_1 is $S(O)_nR_5$, CF_3, NR_6R_7, CO_2R_8, $SO_2NR_9R_{10}$,





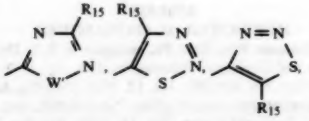
OSO_2R_{13}, CH_2OR_{14} or Q;
R_2 is $S(O)_mR_5$, CF_3, NR_6R_7, CO_2R_8, $SO_2NR_9R_{10}$,

OSO_2R_{13}, CH_2OR_{14} or Q;
R_3 is H, Cl, F, Br, CH_3, OCH_3 or CF_3;
R_4 is H or CH_3;
R_5 is C_1–C_3 alkyl;
R_6 and R_7 are independently CH_3 or CH_2CH_3;
R_8 is C_1–C_3 alkyl, $CH_2CH{=}CH_2$, CH_2CH_2Cl or $CH_2CH_2OCH_3$;
R_9 is CH_3 or OCH_3;
R_{10} is C_1–C_3 alkyl;
R_{11} is H, Cl, Br, F, CH_3 or OCH_3;
R_{12} is H or CH_3;
R_{13} is C_1–C_3 alkyl or CF_3;
R_{14} is C_1–C_3 alkyl or CF_2H;
n is 0, 1 or 2;
m is 0 or 1;

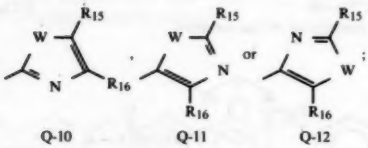


Q-1 Q-2 Q-3

Q-4 Q-5 Q-6

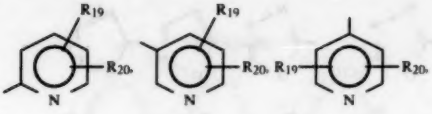


Q-7 Q-8 Q-9

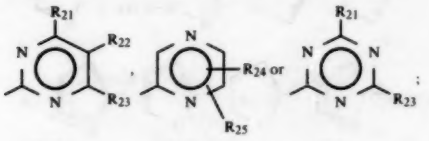


Q-10 Q-11 Q-12

W is O, S or NR_{18};
W' is O or S;
R_{15}, R_{16}, R_{17} and R_{18} are independently H or CH_3;
Q is also

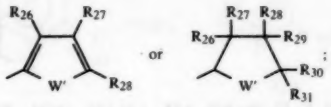


Q-13 Q-14 Q-15



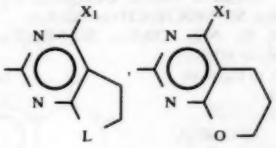
Q-16 Q-17 Q-18

R_{19}, R_{20}, R_{22}, R_{24} and R_{25} are independently H or CH_3;
R_{21} and R_{23} are independently H, CH_3 or OCH_3;
Q is also

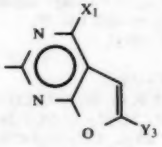


Q-19 Q-20

R_{26}, R_{27}, R_{28} R_{29}, R_{30} and R_{31} are independently H or CH_3;
A is



A-2 A-3



A-4

L is O;
X_1 is CH_3, OCH_3, Cl or OCF_2H; and
Y_3 is H or CH_3;
and agriculturally suitable salts thereof;
provided that
(a) when either one of R_1 or R_2 is CF_3, then the other is also CF_3;
(b) R_1 and R_2 are not simultaneously CO_2R_8;
(c) when either one of R_1 or R_2 is $SO_2NR_9R_{10}$, then the other must not be $S(O)_nR_5$, $S(O)_mR_5$, CH_2OR_{14} or NR_6R_7;
(d) when R_9 is OCH_3, then R_{10} is CH_3;
(e) when either one of R_1 or R_2 is CO_2R_8, then the other must not be $S(O)_nR_5$, $S(O)_mR_5$ or NR_6R_7; and
(f) the total number of carbon atoms in R_{26} to R_{31} combined, is equal to or less than four.

3. An agriculturally suitable composition for controlling the growth of undesired vegetation comprising an effective

amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,705,557

HERBICIDAL 1-ARYL-Δ^2-1,2,4-TRIAZOLIN-5-ONES AND SULFUR ANALOGS THEREOF

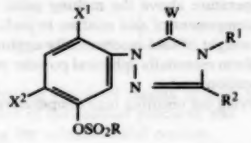
Lester L. Maravetz, Westfield, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 650,755, Sep. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 533,013, Sep. 15, 1983, abandoned. This application Feb. 10, 1986, Ser. No. 829,541

Int. Cl.[4] A01N *43/36*; **C07D** *249/12*

U.S. Cl. 71—92 **27 Claims**

1. An herbicidal compound of the formula



in which X^1 and X^2 are independently selected from halogen, haloalkyl and alkyl;

W is oxygen;

R is alkyl, haloalkyl, cyanoalkyl;

R^1 is alkyl, haloalkyl, cyanoalkyl, alkenyl, alkynyl, or a group of the formula —alkyl—Y^1—R^6;

R^2 is alkyl, cyanoalkyl, haloalkyl, arylalkyl, or a group of the formula —alkyl—Y^2—R^7;

R^6, R^7 are independently alkyl, alkoxycarbonylalkyl, alkenyl, or alkynyl; and

Y^1, Y^2 are independently oxygen or $S(O)_r$ in which r is 0 to 2.

4,705,558

HERBICIDAL PYRAZOLESULFONAMIDES

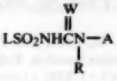
Stephen L. Hartzell, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 662,789, Oct. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 651,082, Sep. 17, 1984, abandoned. This application Aug. 1, 1985, Ser. No. 760,713

Int. Cl.[4] C07D *403/14, 405/14, 409/14*; **A01N** *47/36*

U.S. Cl. 71—92 **44 Claims**

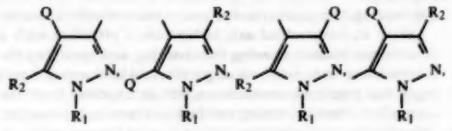
1. A compound of the formula



I

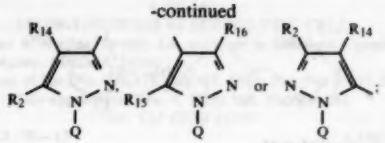
wherein

L is



L-1 L-2 L-3 L-4

-continued



L-5 L-6 L-7

Q is selected from a saturated 5- or 6-membered ring containing one S or O heteroatom, and an unsaturated 5- or 6-membered ring containing 1–3 heteroatoms selected from one S, one O, 1–3N and combinations thereof and Q may optionally be substituted by one or more groups selected from C_1–C_4 alkyl, C_1–C_4 haloalkyl, mercapto, benzylthio, halogen, C_1–C_4 alkoxy, C_1–C_6 alkylthio, C_3–C_4 alkenyl, C_3–C_4 alkenylthio, C_3–C_4 alkynylthio, C_3–C_4 haloalkenylthio, C_3–C_4 alkenyloxy, C_1–C_2 haloalkoxy, C_1–C_2 haloalkylthio, C_2–C_4 cyanoalkylthio, C_3–C_6 alkoxycarbonylalkylthio, C_2–C_5 alkoxyalkylthio or C_3–C_5 acetylalkylthio;

W is O or S;

R is H or CH_3;

R_1 is H, C_1–C_3 alkyl, C_1–C_3 haloalkyl or phenyl optionally substituted by Cl, NO_2, CH_3 or OCH_3;

R_2 is H, Cl or CH_3;

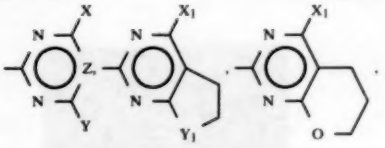
R_{14} is H, C_1–C_4 alkyl, F, Cl, Br, NO_2, C_1–C_3 haloalkylthio, C_3–C_4 alkenyl, C_3–C_4 alkynyl, CO_2R_{17}, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl or $SO_2NR^IR^{II}$;

R_{15} and R_{16} are independently H, C_1–C_4 alkyl, C_2–C_4 alkoxyalkyl, C_1–C_3 haloalkylthio, C_1–C_3 haloalkoxy, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_3 alkylsulfonyl, F, Cl, Br, CO_2R_{17} or $SO_2NR^IR^{II}$;

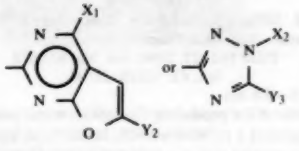
R^I and R^{II} are independently C_1–C_3 alkyl;

R_{17} is C_1–C_3 alkyl, $CH_2CH{=}CH_2$, $CH_2C{\equiv}CH$, CH_2CH_2Cl or $CH_2CH_2OCH_3$;

A is



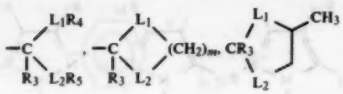
A-1 A-2 A-3



A-4 A-5

X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, halogen, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3 alkyl)amino;

Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylthioalkyl, C_2–C_5 alkylsulfinylalkyl, C_2–C_5 alkylsulfonylalkyl, C_1–C_4 haloalkyl, C_3–C_5 cycloalkyl, C_2–C_4 alkynyl, $C(O)R_3$,



or $N(OCH_3)CH_3$;

m is 2 or 3;

L_1 and L_2 are independently O or S;

R_3 is H or CH_3;

R_4 and R_5 are independently C_1–C_2 alkyl;

Z is CH;

Y_1 is O or CH_2;

X_1 is CH_3, OCH_3, OC_2H_5 or OCF_2H;

Y_2 is H or CH_3;

X_2 is CH_3, C_2H_5 or CH_2CF_3;

Y_3 is OCH_3, OC_2H_5, SCH_3, SC_2H_5, OCF_2H, SCF_2H, CH_3 or C_2H_5;

and their agriculturally suitable salts; provided that

(1) when X is Cl, Br, F or I, then Y is OCH_3, OC_2H_5, $N(OCH_3)CH_3$, $NHCH_3$, $N(CH_3)_2$, NH_2 or OCF_2H;

(2) when W is S, then R is H, A is A-1, and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$ or

(3) when the total number of carbon atoms of X and Y is greater than four, then the total number of carbon atoms of Q and R_2, R_{14}, R_{15} or R_{16} is less than or equal to ten; and

(4) when L is L-5, L-6 or L-7, then Q must be bonded to the pyrazole ring nitrogen through a carbon atom.

4,705,559

METHOD FOR PRODUCING FINE COBALT METAL POWDER

Michael J. Miller, Towanda, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Feb. 28, 1986, Ser. No. 835,075

Int. Cl.[4] C22B *23/04*

U.S. Cl. 75—0.5 AA **6 Claims**

1. A method for producing fine cobalt metal powder comprising digesting a cobaltic ammine halide in an aqueous solution with a mineral acid at a temperature of at least about 110° C. for a sufficient time to decompose said cobaltic ammine halide to form an amorphous hydrated cobalt oxide containing precipitate, the digestion being carried out at a suitable pressure in a sufficiently closed vessel to permit said temperature being attained in said solution, said aqueous solution of said cobaltic ammine halide containing from about 5 grams of cobalt per liter up to the limits of solubility of said cobaltic ammine halide, and said mineral acid being present in an amount sufficient to result in the subsequent cobalt metal powder having a Fisher Subsieve Size of no greater than about 2.1, separating the cobalt containing precipitate from the resulting solution, reducing said cobalt containing precipitate to form said fine cobalt powder.

4,705,560

PROCESS FOR PRODUCING METALLIC POWDERS

Preston B. Kemp, Jr., Athens; Walter A. Johnson, Towanda, and James Q. Steigelman, Athens, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 14, 1986, Ser. No. 918,182

Int. Cl.[4] B22F *9/00*

U.S. Cl. 75—0.5 B **4 Claims**

1. A process for producing essentially spherical metallic powders particles, said process comprising:

(a) mechanically agglomerating a mixture comprising powders, wherein said powders are selected from the group consisting of metals, metal alloys, metal-ceramic composites, ceramics, and wherein at least one of said powders is a relatively ductile and/or malleable metal;

(b) entraining the resulting mechanically agglomerated powder particles in a carrier gas and passing said mechanically agglomerated particles through a high temperature zone at a temperature above the melting point of the lowest melting component of said mixture to melt at least about 50% by weight of said mechanically agglomerated particles and form essentially spherical powder particles of said melted portion; and

(c) resolidifying the resulting high temperature treated material.

4,705,561

MAGNESIUM CALCIUM OXIDE COMPOSITE

William G. Green, Freeport, Tex., assignor to The Dow Chemical Company

Filed Jan. 27, 1986, Ser. No. 822,459

Int. Cl.[4] C21C *7/02*

U.S. Cl. 75—58 **13 Claims**

1. A method of manufacture of an injectable for molten ferrous metal comprising the steps of:

(a) obtaining a specified weight of magnesium in a molten state;

(b) adding calcium oxide to the magnesium accompanied with mixing and continuing until sufficent calcium oxide has been added that a specified ratio between magnesium and calcium oxide has been achieved and mixing in the molten magnesium has occurred;

(c) cooling the mixture to solidify the mixture; and

(d) crushing the cooled mixture to particulate form for subsequent injection into molten metal.

4,705,562

METHOD FOR WORKING-UP WASTE PRODUCTS CONTAINING VALUABLE METALS

Martin L. Hedlund, Ursviken, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

PCT No. PCT/SE86/00082, § 371 Date Oct. 27, 1986, § 102(e) Date Oct. 27, 1986, PCT Pub. No. WO86/05211, PCT Pub. Date Sep. 12, 1986

PCT Filed Feb. 25, 1986, Ser. No. 931,688

Claims priority, application Sweden, Feb. 27, 1985, 8500959-5

Int. Cl.[4] C22B *11/00*

U.S. Cl. 75—83 **15 Claims**

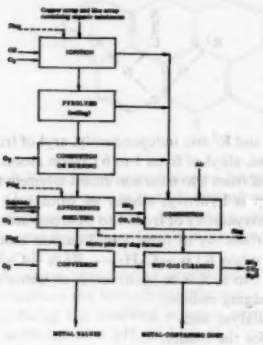
1. A method for treating valuable metal-bearing waste products containing a substantial amount of organic constituents comprising:

(a) heating the waste products in a reactor which rotates about its longitudinal axis and which is provided with a common reactor opening for charging and emptying the reactor so as to combust or pyrolyze at least a major part of the organic constituents which is expelled from the reactor thereby forming residual products in the reactor;

(b) adding metal sulphide material in solid form to the reactor;

(c) heating the metal sulphide material in contact with the

residual products in the reactor so as to form a molten bath containing at least a metal sulphide phase or a metal-



lic phase having dissolved therein at least the valuable metal content of the residual products; and

(c) recovering the valuable metal content.

4,705,563

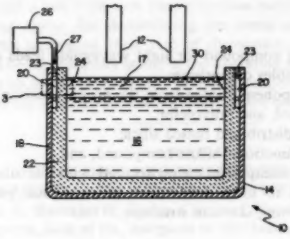
METHODS AND APPARATUS FOR REDUCING CORROSION IN REFRACTORY LININGS

Roger B. Poeppel, Glen Ellyn; Sherman Greenberg, Oak Lawn, and Dwight R. Diercks, Plainfield, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 23, 1986, Ser. No. 922,363

Int. Cl.[4] C22B *9/00*

U.S. Cl. 75—95 **7 Claims**



1. A process for maintaining chromium ions in a +3 valence state, the valence of the chromium ions being determined by the temperature and the oxygen partial pressure at the chromium ions, the process comprising the steps of:

maintaining the chromium ions at a temperature between about 1600° C. and 1800° C.; and

introducing a gas mixture through a porous refractory wall of a vessel in which the porous refractory wall includes the chromium ions, the gas mixture maintaining an oxygen partial pressure between about 10^{-10} and 10^{-8} atmospheres at the chromium ions, the gas chemically protecting the chromium ions to control the valence state of the chromium ions.

4,705,564

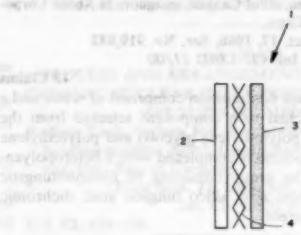
FLOW-THROUGH ELECTROLYTIC CELL

Stephen A. Noding, Brusly, La., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 776,178, Sep. 13, 1985, Pat. No. 4,652,355. This application Nov. 4, 1986, Ser. No. 926,751

Int. Cl.[4] C22B *19/00*

U.S. Cl. 75—120 **5 Claims**



1. A process comprising:

(a) contacting a solution of a lead salt with a porous substrate under conditions sufficient to deposit the lead salt into the porous substrate;

(b) oxidizing the lead salt in situ to form an oxide of lead; and

(c) reducing the lead oxide in situ under conditions sufficient to form lead particles within the pores of the substrate.

4,705,565

HIGH SPEED STEEL SINTERING POWDER MADE FROM RECLAIMED GRINDING SLUDGE AND OBJECTS SINTERED THEREFROM

Robert J. Beltz, 743 Main St., and Joseph D. Dankoff, R.D. #5 Box 19, both of Latrobe, Pa. 15650

Filed Jun. 25, 1986, Ser. No. 881,158

Int. Cl.[4] C22C *29/12*

U.S. Cl. 75—235 **31 Claims**

1. A powder for sintering sintered objects therefrom, said sintering powder consisting essentially of:

high speed steel particles: and

alumina particles.

4,705,566

POLISHING COMPOSITION FOR MEMORY HARD DISC

Tetsuji Senda, and Takashi Baba, both of Aichi, Japan, assignors to Fujimi Kenmazai Kogyo Kabushiki Kaisha, Japan

Filed May 21, 1986, Ser. No. 865,984

Claims priority, application Japan, Jul. 25, 1985, 60-164779

Int. Cl.[4] C09G *1/02*

U.S. Cl. 106—3 **12 Claims**

1. A polishing composition for a memory hard disc, comprising water, a polishing agent of aluminum oxide, and a polishing

accelerator selected from the group consisting of nickel nitrate, mixtures of nickel nitrate and aluminum nitrate, and mixtures of nickel sulfate and aluminum nitrate.

4,705,567

INK JET COMPOSITIONS WITH INSOLUBLE DYE COMPLEXES

Michael L. Hair, Oakville; Kar P. Lok, Sarnia, and Francoise M. Winnik, Toronto, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 17, 1986, Ser. No. 919,932

Int. Cl.[4] C09D *11/00*

U.S. Cl. 106—20 **13 Claims**

1. A heterophase ink composition comprised of water and a dye covalently attached to a component selected from the group consisting of poly(ethylene glycols) and poly(ethylene imines), which component is complexed with a heteropolyanion selected from the group consisting of phosphotungstic acid, phosphomolybdic acid, silico tungstic acid, dichromic acid and the salts thereof.

4,705,568

COMPOSITIONS INCORPORATING TITANIUM COMPOUNDS

Peter D. Kay, Hartlepool, and Michael C. Girot, Stockton on Tees, both of England, assignors to Tioxide Group PLC, London, England

Filed Jul. 12, 1985, Ser. No. 754,293

Claims priority, application United Kingdom, Jul. 20, 1984, 8418518

Int. Cl.[4] C09D *11/14*

U.S. Cl. 106—26 **16 Claims**

1. An ink for marking a plastic substrate, the ink containing an adhesion promoting agent which comprises the reaction product of a titanium orthoester and a compound selected from the group consisting of monoalkyl phosphates, dialkyl phosphates and mixtures thereof wherein said reaction product has a molar ratio of titanium to phosphate expressed as Ti:P of from 4:1 to 1:2.

4,705,569

HYDRAULIC MATERIAL COMPOSITION

Waichi Kobayashi, Ube, Japan, assignor to Ube Industries, Ltd., Yamaguchi, Japan

Filed May 1, 1986, Ser. No. 858,176

Claims priority, application Japan, May 2, 1985, 60-95768

Int. Cl.[4] C04B *7/00*

U.S. Cl. 106—85 **11 Claims**

1. A hydraulic material composition comprising cement and 0.01 to 2.0% by weight, as zinc oxide based on the cement, of a zinc-containing compound, wherein the zinc-containing compound is in the form of particles having an average particle diameter of at least 20 micrometers.

4,705,570

METHOD OF MANUFACTURING A BONDED PARTICULATE ARTICLE BY REACTING A POLYOL AND A METEROCYCLIC COMPOUND

Albert P. Paul, Teaneck, N.J., and Roger J. Card, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 5, 1985, Ser. No. 795,067

Int. Cl.[4] C08L *89/00*; B28B *7/28*

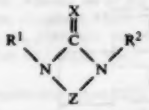
U.S. Cl. 106—124 **9 Claims**

1. A curable composition adapted to produce a shaped bonded particulate article, said composition comprising

(i) a major amount of a particulate material; and, in a minor amount, as a binder therefor,

(ii) A polyol selected from a saccharide, a saccharide polymer, a glyco protein, or mixtures of any of the foregoing;

(iii) a crosslinker for said polyol (ii) comprising a compound of the formula



wherein R^1 and R^2 are, independently, aryl of from 6 to 12 carbon atoms, alkyl of from 1 to 6 carbon atoms or substituted alkyl of from 1 to 6 carbon atoms wherein the substituting group is hydroxy, alkoxy of from 1 to 6 carbon atoms, hydroxyalkoxy of from 1 to 6 carbon atoms, cyano, carboxy, carbalkoxy of from 1 to 7 carbon atoms of carbamoyl, or when R^1 is $-C_xH_{2x}-$, R^2 is $-C_xH_{2x}O-$, x being from 1 to 6, X is oxygen, sulfur or imino and Z is a divalent bridging radical;

(iv) an acid catalyst; and

(v) a solvent for the binder.

4,705,571

FILLING COMPOUND FOR OPTICAL WAVEGUIDE BUFFER AND/OR OPTICAL WAVEGUIDE CABLES

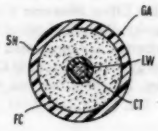
Gerhard Lange, and Erich Weil, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 3, 1986, Ser. No. 881,950

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524166

Int. Cl.[4] H02G *15/00*

U.S. Cl. 106—287.1 **24 Claims**



1. A filling compound for light waveguide leads and light waveguide cables comprising:

a first component chosen from the group consisting of: polyglycol; and polyolefin;

a finely distributed fumed silica;

a multi-functional silane compound; and

the first component being reacted with the silane compound to form a synthetic material that provides a supporting skeleton structure.

4,705,572

PROCESS FOR THE PREPARATION OF PIGMENTS OF THE ANTHANTHRONE SERIES

Ernst Spietschka, Idstein, and Manfred Urban, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

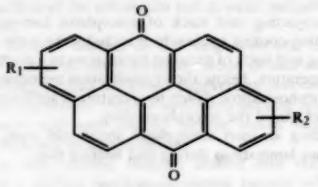
Filed Jun. 9, 1986, Ser. No. 872,542

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1985, 3520806

Int. Cl.[4] C08K *5/08*; C09B *3/60, 67/54*

U.S. Cl. 106—288 Q **5 Claims**

1. A process for the preparation of a pigment of the anthanthrone series having the formula



in which R_1 and R_2 denote chlorine, bromine or iodine atoms or C_1–C_4-alkoxy groups, which comprises:

a. reducing with sodium dithionite a crude anthanthrone of the said formula to the leuco form in an alkaline medium at a pH > 10,

b. adding an inorganic or organic acid, to pH 7 to 11.5, to precipitate the leuco anthanthrone,

c. oxidizing the resulting aqueous suspension of leuco anthanthrone at a pH of 7 to 11.5 to give finely-divided anthanthrone pre-pigment, and

d. treating the resulting finely divided anthanthrone pre-pigment with solvent.

4,705,573

DESCALING PROCESS

Christopher J. Wood, Mountain View, Calif.; David Bradbury, Tresham; Timothy Swan, Lime Grove; Michael G. Segal, Bristol, and Robin M. Sellers, Gloucestershire, all of England, assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Continuation of Ser. No. 507,703, Jun. 23, 1983, abandoned, and a continuation-in-part of Ser. No. 221,931, Dec. 31, 1980, abandoned. This application Aug. 6, 1985, Ser. No. 763,754

Claims priority, application United Kingdom, Jan. 8, 1980, 8000584

Int. Cl.⁴ C23G *1/02, 1/08*

U.S. Cl. 134—3 **16 Claims**

1. A process for the removal of deposits consisting essentially of the oxides of one or more transition metals from a surface, which process comprises contacting the said surface at a pH in the range of from 2.0 to 7.0 with a reagent comprising a one-electron reducing agent which is the complex formed between a low oxidation state transition metal ion and a complexing agent, for destabilizing the metal oxides deposited, thereby increasing their rate of dissolution, the complexing agent being thermally stable at the operating pH and present in order to form the necessary complex reagent and also to increase the thermodynamic solubility of the metal ions released.

4,705,574

DEBONDING PROCESS FOR REMOVING NON-METALLIC COATINGS FROM METAL HANGERS

Klaus A. Burckhardt, Spring City, and Howard D. Brodbeck, Berwyn, both of Pa., assignors to MG Industries, Inc., Valley Forge, Pa.

Filed Feb. 4, 1985, Ser. No. 697,951

Int. Cl.⁴ B08B *7/02*

U.S. Cl. 134—17 **5 Claims**

1. A process for removing layers of paint or other non-metallic coatings from a coated metal hanger comprising the steps of

freezing the coating to embrittle the coating and shrink the coating toward the metal hanger,

heating the metal hanger by electrical means which heats the metal to expand the metal toward the coating,

and said freezing and heating stressing the coating by said expanding and shrinking to break and fragment the coating and cause the coating to fall off the metal hanger.

5. A process for removing layers of paint or other non-metallic coatings from a coated metal hanger comprising the steps of

freezing the coated metal hanger to shrink the metal and the coating,

shrinking the metal more and faster than the coating to loosen the bond between the metal and the coating and open a gap between the metal and the coating,

heating the metal hanger by electrical means which heats the metal to expand the metal towards the coating,

and said freezing and heating stressing the cold coating by expanding hot metal to break and fragment the coating, and cause the coating to fall from the hanger.

4,705,575

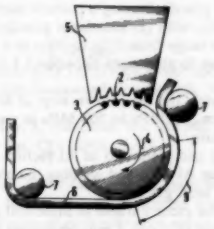
PROCESS AND ARRANGEMENT FOR SEPARATING CERAMIC NUCLEAR FUELS FROM METALLIC CASING OR SUPPORT MEMBERS

Rudiger Koch, Aachen, Fed. Rep. of Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Fed. Rep. of Germany

Filed Mar. 12, 1985, Ser. No. 711,075

Int. Cl.⁴ B08D *9/04*

U.S. Cl. 134—24 **5 Claims**



1. In a process for separating ceramic nuclear fuels out of metallic tubular support members or tubular support member parts within which the nuclear fuels adhere comprising:

immersing in a tank containing liquid the tubular support member or tubular support member parts with the nuclear fuel adhered thereto;

inserting a liquid jet nozzle into the internal space of said tubular support member or tubular support member parts;

directing a high pressure liquid jet against the ceramic fuels for effecting then fragmentation; and

washing off the nuclear fuel while in the immersed condition with said high-pressure liquid jet.

4,705,576

ACIDIC CHROMIUM CONTAINING COATING SOLUTION FOR ZINC OR CADMIUM SURFACES

Klaus-Peter Klos; Karl-Heinz Lindemann, both of Trebur, and Willi Birnstiel, Pfungstadt, all of Fed. Rep. of Germany, assignors to Elektro-Brite GmbH, Trebur/Industriegebiet, Fed. Rep. of Germany

Filed Nov. 3, 1986, Ser. No. 926,918

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1986, 3629008

Int. Cl.⁴ C23C *22/24*; C04B *9/02*

U.S. Cl. 148—6.2 **11 Claims**

1. An aqueous acidic chrome(III) and fluoride containing coating solution for treating zinc, zinc alloy or cadmium surfaces characterized in that it contains besides trivalent chromium ion, fluoride ion and an acid one or more complex compounds of the formula

$$[Cr(H_2O)_{6-x}F_x]^{(3-x)+}A^- \quad (I)$$

wherein x is an integer of 1 to 3 and A is an anion of the group selected of nitrate, sulfate, phosphate, chloride, bromide, fluoride and iodide.

4,705,577

NUCLEAR FUEL ELEMENT CONTAINING LOW-ENRICHMENT URANIUM AND METHOD FOR PRODUCING SAME

Gerhard Ondracek, Linkenheim, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Continuation of Ser. No. 648,624, Sep. 10, 1984, abandoned, which is a continuation of Ser. No. 320,057, Nov. 10, 1981, abandoned. This application Jun. 23, 1986, Ser. No. 878,517

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1980, 3042424

Int. Cl.[4] G21C *3/28, 3/36;* **C21D** *1/00*

U.S. Cl. 148—11.5 P **2 Claims**

1. Process for producing a plate-shaped high power nuclear fuel element containing lowenrichment uranium as fissionable material, the low-enrichment uranium containing 5 to 20 percent by weight uranium^{235}, the fuel element essentially comprising a UAl_4 plate provided with an aluminum sheath of an Al alloy and impurities inherent in the manufacturing process, comprising the following steps:

(a) intimately mixing (1) a powder of low enrichment uranium metal or uranium compound U_6Fe, with the uranium in the metal or compound being 5 to 20 percent by weight U^{235}, the powder having a particle size in the range from 0.1μ to 90μ with (2) aluminum powder having a particle size in the range from 0.1μ to 100μ in a weight ratio range of uranium to aluminum between 1.1 U:1 Al and 2.2 U:1 Al;

(b) prepressing the mixture in step a) at a pressure in the range from 300 MPa to 500 MPa at room temperature to form a plate;

(c) inserting said plate into an Al picture frame or a picture frame of an Al alloy and welding the plate to said frame in vacuo or inert gas argon;

(d) rolling the picture frame in three roll passes, a reduction in thickness of about 1 mm occurring in each of the first and second passes, and a reduction in thickness by about 15% occurring during the third pass, at a temperature of 800°±25° K.; and

(e) inserting the plate in the frame after the third roll pass between two Mo sheets, one Mo sheet being at the underside of the plate, inserting the framed plate together with the Mo sheets in a clamping device, and subsequently heat treating the clamped plate at 800°±25° K. for a duration of at least 75 hours in order to form a plate consisting essentially of UAl_4 and other uranium-aluminum compounds and containing at least 50 weight % UAl_4 based on the weight of the plate.

4,705,578

METHOD OF CONSTRUCTING A MAGNETIC CORE

Kou C. Lin, Hermitage, Pa.; Charles E. Burkhardt, Garden City, S.C., and Harry R. Sheppard, Hermitage, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 16, 1986, Ser. No. 852,876

Int. Cl.[4] C21D *1/04*

U.S. Cl. 148—108 **10 Claims**

1. A method of constructing laminations of an amorphous alloy, suitable for use in a magnetic core for static electrical inductive apparatus, to improve the core space factor, to reduce core losses, and to reduce the sensitivity of the amorphous laminations to core clamping pressures, comprising the steps of:

cutting laminations from a strip of amorphous alloy,

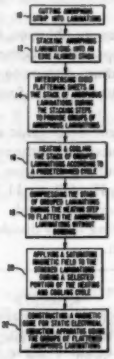
stacking said amorphous laminations, to provide a stack of laminations,

said stacking step including the step of dividing said stack of laminations into a plurality of groups by interspersing rigid flattening sheets between the groups, with the surfaces of said rigid flattening sheets which contact the amorphous laminations being smoother than the surfaces of the amorphous laminations, and with the thickness dimension of each of said rigid flattening sheets exceeding the thickness dimension of each of said amorphous laminations,

and subjecting said stack of amorphous laminations to a heating-cooling cycle which includes the steps of:

heating said stack of grouped laminations to a predetermined temperature, below the crystallization temperature of the amorphous alloy, which temperature is sufficient to stress relief anneal the amorphous alloy,

providing an inert atmosphere about said stack of amorphous laminations during said heating step,



pressing said stack of grouped laminations during said heating step to provide a pressure of at least 4 psi, but below the pressure which would initiate metallurgical bonding of adjacent laminations,

cooling said stack of grouped laminations,

and applying a saturating magnetic field to said stack of grouped laminations, at least during a portion of said heating-cooling cycle.

4,705,579

METHOD FOR COOLING A METAL STRIP IN A CONTINUOUS ANNEALING FURNACE

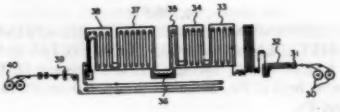
Taisuke Fujii, Kitakyushu, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 574,349, Jan. 27, 1984, abandoned. This application Feb. 6, 1986, Ser. No. 827,488

Claims priority, application Japan, Feb. 3, 1983, 58-15521

Int. Cl.[4] C21D *1/78*

U.S. Cl. 148—142 **7 Claims**



1. A method for cooling a steel strip in a continuous annealing furnace, comprising the steps of:

continuously conveying a steel strip through a heating zone, a soaking zone, and a primary cooling zone of the continuous annealing furnace; and

carrying out a primary zone roll-cooling of the steel strip;

said roll-cooling step further comprising the steps of:

bringing said conveyed steel strip into contact with at least one cooling roll and turning said steel strip around said at least one cooling roll along a predetermined conveying path of contact with said at least one cooling roll, while imparting tension to the strip, said at least one cooling roll comprising a roll shaft and a shrinkage-fitted roll sheath

forming a cooling surface fixed to said roll shaft via an inner surface of the roll sheath and an outer surface of the roll shaft;

retaining uniform contact of said strip with said cooling surface across the short width direction of said strip, by said shrinkage-fitted roll sheath suppressing heat crown of said cooling surface thereby uniformly cooling said strip in contact with said cooling surface across said short width direction of said strip; and

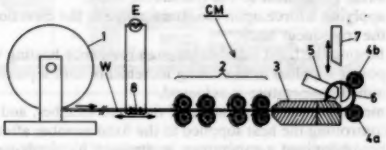
circulating said cooling medium around said roll shaft through a cooling medium-circulating passage which is formed on at least the inner surface of said roll sheath or the outer surface of said roll shaft or both.

4,705,580

CUTTING METHOD TO BE APPLIED TO PRODUCING HELICAL SPRINGS BY COLD-FORMING THICK HIGH-STRENGTH WIRE

Takao Yamazaki, Fujisawa, Japan, assignor to Neturen Co., Ltd., Tokyo, Japan

Filed May 14, 1986, Ser. No. 863,253
Claims priority, application Japan, Aug. 27, 1985, 60-186720
Int. Cl.[4] C21D *9/52*
U.S. Cl. 148—154 **3 Claims**



1. A cutting method for producing helical springs by cold-forming a thick high-strength wire being fed continuously to a coiling machine having a wire path and cutter in proximity to the end of said path, in a helical coil and cutting the thick high-strength wire at the end coil of the helical coil, which comprises:

(a) interrupting wire feeding operation for a predetermined period of time immediately after the helical coil has been formed on the coiling machine;

(b) heating a portion of a predetermined length of the wire on the wire path of the coiling machine before the cutter of the coiling machine, at a distance corresponding to the length of wire in the helical coil from the position of the cutter, by heating means for heating the wire at high rate to a predetermined temperature in the range of 400° to 750° C. within the predetermined period of time in which the wire feeding operation is interrupted; and

(c) cutting the wire substantially in the middle of the heated portion.

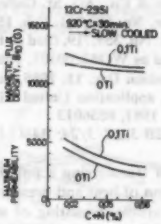
4,705,581

SOFT MAGNETIC STAINLESS STEEL

Yoshinobu Honkura, Konan; Kouji Murata, and Takashi Yokoyama, both of Tokai, all of Japan, assignors to Aichi Steel Works, Ltd., Tokai, Japan

Filed Apr. 14, 1986, Ser. No. 851,159
Claims priority, application Japan, Apr. 16, 1985, 60-81001
Int. Cl.[4] C22C *38/28*
U.S. Cl. 148—307 **3 Claims**

1. A soft magnetic stainless steel having a maximum permeability of not less than 4400, a magnetic flux density of not less than 12,000 G and a fatigue strength after welding of not lower than 120 kgf/cm^2, consisting essentially of, by weight, up to 0.03% of C, 2.0 to 3.0% of Si, up to 0.40% of Mn, 0.015 to 0.050% of S, 10 to 13% of Cr, 0.05 to 0.20% of Ti, up to 0.03% of N, up to 0.010% of Al, and the balance of Fe and inevitable



impurities, with a proviso that C + N content is not more than 0.050%.

4,705,582

DESENSITIZED EXPLOSIVE COMPOSITION

Stephen A. Aubert, 300 Greenwood Cove North, Niceville, Fla. 32578

Filed Nov. 3, 1986, Ser. No. 925,960
Int. Cl.[4] C06B *25/34*
U.S. Cl. 149—92 **7 Claims**

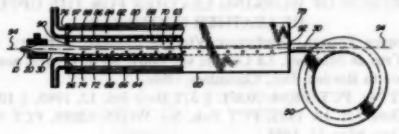
1. A melt-cast, TNT-based explosive composition consisting essentially of about 30 to 99.5 weight percent trinitrotoluene, about 4 to 20 weight percent ozokerite wax, about 0.025 to 0.20 weight percent emulsifier and about 0.5 t0 2.5 weight percent cellulosic material.

4,705,583

METHOD AND APPARATUS FOR SUPPORTING AN ARTICLE OF INDEFINITE LENGTH

Bretislav P. Zuber, Montreal, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 14, 1986, Ser. No. 851,630
Int. Cl.[4] H01B *13/14*
U.S. Cl. 156—52 **20 Claims**



10. A method of making an electrical cable comprising:

drawing a core of the cable along a passline while providing it with a surrounding jacket extruded around the core; and

cooling and supporting the resultant cable by passing the cable through a channel forming device while subjecting the cable to the cooling influence of a cooling fluid, the cooling fluid introduced into the channel by directing it upwardly away from a lower channel defining surface and against an underside of the cable so as to exert a net upward fluid pressure on the cable to support it away from the lower channel defining surface of the device.

4,705,584

APPLICATION OF POLYMERIC MATERIALS TO SUBSTRATES

Alfred E. Lauchenauer, Seestrasse, Switzerland, assignor to Jacob Schlaepfer & Co., AG, St. Gallen, Switzerland

Division of Ser. No. 580,751, Feb. 15, 1984, which is a continuation of Ser. No. 359,719, filed as PCT EP81/00095, Jul. 10, 1981, published as WO82/00307, Feb. 4, 1982, abandoned. This application Dec. 11, 1985, Ser. No. 807,556

Claims priority, application United Kingdom, Jul. 10, 1980, 8022653; Nov. 10, 1981, 8036013

Int. Cl.[4] B32B *5/18, 3/24;* B44C *1/16;* C09J *5/00*

U.S. Cl. 156—79 13 Claims

1. A process for transferring a polymeric article to a substrate by application of heat and pressure, which comprises:

(1) forming an article consisting of at least one layer of a composite polymeric material by applying a composite polymeric material onto a release sheet,

(2) applying said article to a substrate with said layer of polymeric material toward said substrate,

(3) subjecting said article and said substrate to pressure and a first heat at a tackifying temperature to form a composite structure,

(4) permitting said composite structure to cool below the tackifying temperature,

(5) removing the release sheet,

(6) subsequently applying a second heat without pressure at a temperature which is higher than the tackifying temperature tocause an interreaction which modifies the chemical structure of said composite polymeric material, and

(7) permitting the structure to cool.

4,705,585

PRODUCTION OF GLASS OR GLASS-CERAMIC TO METAL SEALS WITH THE APPLICATION OF PRESSURE

Michael D. Kelly, West Alexandria, and Daniel P. Kramer, Dayton, both of Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 4, 1985, Ser. No. 688,671

Int. Cl.[4] B32B *31/20*

U.S. Cl. 156—89 7 Claims

1. In a process for preparing a glass or glass-ceramic to metal seal comprising contacting the glass with the metal and heat-treating the glass and metal under conditions whereby the glass to metal seal is effected and, optionally, the glass is converted to a glass-ceramic, the improvement comprising carrying out the heat-treating step under hot isostatic pressing and using molten glass.

4,705,586

METHOD OF WORKING LEATHER FOR THE UPPERS OF LEATHER FOOTWEAR

Jacques Pouget, Gradignan; Vincent Lipovac, Premery, and Yves de Mauduit, La Charite sur Loire, all of France, assignors to Borden, Inc., Columbus, Ohio

PCT No. PCT/FR84/00261, § 371 Date Jul. 12, 1985, § 102(e) Date Jul. 12, 1985, PCT Pub. No. WO85/02095, PCT Pub. Date May 23, 1985

PCT Filed Nov. 14, 1984, Ser. No. 754,443

Claims priority, application France, Nov. 16, 1983, 83 18232; Nov. 9, 1984, 84 17239

Int. Cl.[4] B32B *31/24*

U.S. Cl. 156—242 31 Claims

1. A method of working leather, characterized by first subjecting the leather to a surface treatment comprising applying on the leather a plurality of superposed layers of which the first one adheres to the leather and the other layer or each other layer adheres to an underlying layer, and then applying to the so-treated leather a working treatment by a high frequency current.

4,705,587

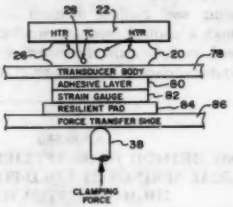
METHOD FOR CURING ADHESIVE IN THE MANUFACTURE OF TRANSDUCERS

Lawrence J. Smith, Darien, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 15, 1985, Ser. No. 787,346

Int. Cl.[4] B29C *67/00;* C09J *5/06;* H01F *7/06;* P32B *31/00*

U.S. Cl. 156—321 1 Claim



1. In a method of curing adhesive applied between a strain gauge and a transducer body, the steps comprising:

a. placing the transducer body into contact with a fixed member,

b. applying an adhesive to a strain gauge and placing the strain gauge next to the transducer body,

c. applying a force upon the strain gauge in the direction of the transducer body,

d. heating the fixed member through resistance heating with power supplied in increasing increments until a predetermined temperature is achieved,

e. measuring the temperature of the fixed member, and

f. controlling the heat supplied to the fixed member after the predetermined temperature is attained by applying no power when the fixed member is at the predetermined temperature and supplying full power when the temperature of the fixed member decreases to a second predetermined temperature.

4,705,588

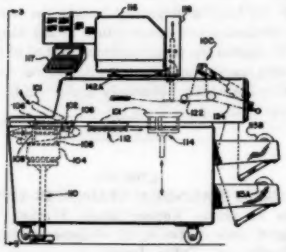
METHOD AND APPARATUS FOR PACKAGE LABELING

Fritz F. Treiber, Centerville, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Jul. 21, 1986, Ser. No. 887,779

Int. Cl.[4] G01G *23/38*

U.S. Cl. 156—360 12 Claims



1. In a packaging machine wherein packages to be wrapped and labeled are conveyed from a package input station to a package wrapping and labeling station where an elevator raises packages into sections of wrapping material which are then wrapped about said packages, a package labeling arrangement comprising:

label supply means for delivering labels for said packages to a label delivery station; and

label applicator means positioned over said elevator for receiving labels from the label delivery station of said label supply means and applying said labels to said sections of wrapping material immediately prior to said packages being wrapped therein.

4,705,589

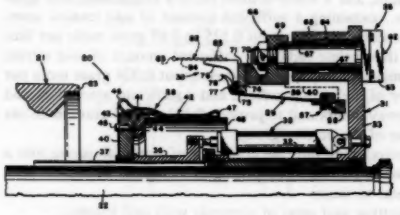
TIRE BUILDING MACHINE

George E. Enders, Salem, Ohio, assignor to NRM Corporation, Columbiana, Ohio

Division of Ser. No. 570,650, Jan. 13, 1984, Pat. No. 4,584,038. This application Jan. 24, 1986, Ser. No. 822,055

Int. Cl.[4] B29D *30/32, 30/24*

U.S. Cl. 156—401 17 Claims



1. A tire building machine comprising a tire building drum for receiving at least one ply of tire material overhanging an axial end of the drum, a bladder turn-up mechanism extending axially outwardly from the drum, an annular array of radially contractible ply-down fingers movable axially to and from a position encircling the overhanging ply edge, and a rigid ring device means axially moving first towards the drum to effect radial contraction of the ply-down fingers to turn the ply edge down over the end of the drum, then to set a tire bead carried thereby against the turned down ply edge at the end of the drum, and then, after having axially retracted to clear the bladder prior to inflation, axially moving the rigid ring device toward the drum to push the bladder of the turn-up mechanism when inflated to cause the ply edge to be progressively wrapped around the bead and then over the drum.

13. A tire building machine comprising a tire building drum for receiving at least one ply of tire material overhanging an axial end of said drum, bead setting means for setting a bead against the tire material at such axial end of said drum, an inflatable annular bladder extending axially outwardly from such axial end of said drum, means for inflating said bladder to turn the overhanging ply edge up around the bead, an axially movable bladder control ring having annular radial pusher surface means for engaging an axially outer side of the bladder when inflated and a generally cylindrical, axially inwardly extending surface means radially outwardly of said pusher surface means for radially constraining said bladder by engaging a radially outer side of the bladder when inflated, and means for axially moving said control ring towards said drum initially to engage the axially inner end of said bladder control ring against said bladder when inflated at a contact point substantially below the inflated height of said bladder and then to force said bladder to wrap around the bead and roll over the drum to continue wrapping of the ply edge around the bead and then over the drum with no appreciable slippage occurring between said bladder and said control ring at such initial point of contact.

4,705,590

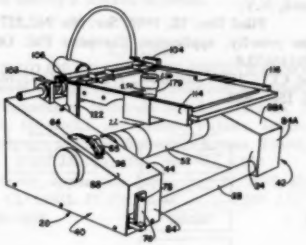
MACHINE FOR ADHESIVELY MOUNTING A PRINTING PLATE ON A PLATE ROLL

Edward Vandenberg, 1621 Dana Ave., Cincinnati, Ohio 45207

Filed Nov. 12, 1986, Ser. No. 929,598

Int. Cl.[4] B41F *27/12*

U.S. Cl. 156—447 4 Claims



1. A machine for mounting a printing plate on a plate roll having an adhesive coated face which comprises a frame, means on the frame for rotatably mounting the plate roll in a selected position, a tilting framework swingably mounted on the frame, a pair of table sections mounted on the tilting framework and overlying the plate roll for supporting the printing plate, means on the tilting framework for aligning the printing plate with the plate roll while the printing plate is supported on the table sections, there being a space between the table sections, the tilting framework swinging to a position at which the adhesive coated face of the plate roll engages the printing plate through the space, and means for turning the plate roll to cause the printing plate to engage flatwise the adhesive coated face for causing adhesion of the printing plate to the adhesive coated face in proper registry.

4,705,591

PULLING PROCESSES AND EQUIPMENT FOR GROWING SILICON CRYSTALS HAVING HIGH AND CONTROLLED CARBON CONTENT

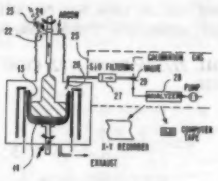
Jean-Francois Carle, Saint Cheron, and Patrick Phillippot, Vigneux, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 6, 1985, Ser. No. 806,150

Claims priority, application European Pat. Off., Dec. 28, 1984, 84430048.3

Int. Cl.[4] C30B *15/14, 15/20*

U.S. Cl. 156—617 SP 2 Claims



1. An improved Czochralski crystal growth process for growing crystals having carbon content that varies during the length of the crystal growth period, comprising the steps of:

introducing oxygen into a crystal puller only during the melting step of said Czochralski crystal growth process; and

monitoring the carbon monoxide concentration in the crystal puller during the pulling step while not controlling the

oxygen or carbon monoxide concentration during this step.

4,705,592

PROCESS FOR PRODUCING PRINTED CIRCUITS

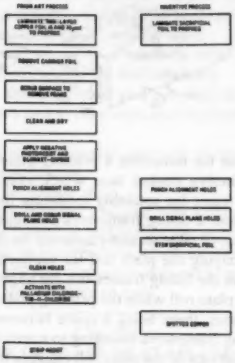
Dieter Bahrle, Schönaich; Friedrich Schwerdt, and Jurgen H. Stehling, both of Herrenberg, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1986, Ser. No. 943,227

Claims priority, application European Pat. Off., Dec. 30, 1985, 85116653.8

Int. Cl.[4] C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—630 17 Claims



1. A process for producing printed circuits comprising the steps of:

sputtering a conductor onto an insulating substrate surface and the walls of through holes therein;

applying a layer of photoresist to the insulating substrate surface;

photolithographically creating channels in the photoresist;

depositing a conductor in the channels and on the walls of the through holes by electroplating;

stripping the photoresist; and

differentially etching to remove the sputtered conductor exposed by the stripping of the photoresist.

4,705,593

ETCHING METHOD

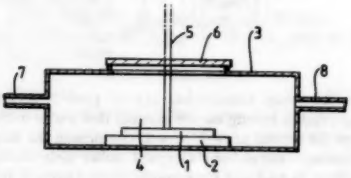
John Haigh, Ipswich, and Martin R. Aylett, Felixstowe, both of England, assignors to British Telecommunications, London, England

Filed Jun. 26, 1986, Ser. No. 881,182

Claims priority, application United Kingdom, Jul. 4, 1985, 8516984

Int. Cl.[4] H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—635 17 Claims



3. A method of etching a pattern onto an exposed surface of a wholly or partly formed opto-electronic device, said surface being on a layer of III–V semiconductor, which method comprises exposing the surface to a reducing atmosphere which contains a halogen gas while illuminating the surface in the desired pattern with radiation adapted to dissociate said halogen gas into halogen radicals which react with the surface whereby the surface is etched with the pattern.

4,705,594

COMPOSITION AND METHOD FOR METAL SURFACE REFINEMENT

Robert G. Zobbi, Southbury, and Mark Michaud, Bristol, both of Conn., assignors to Rem Chemicals, Inc., Southington, Conn.

Filed Nov. 20, 1986, Ser. No. 929,790

Int. Cl.[4] C23F *1/00*; B44C *1/22*

U.S. Cl. 156—637 17 Claims

10. In a process for the refinement of metal surfaces of objects, the steps comprising:

(a) providing an aqueous solution including water, a water-soluble oxalate compound, a water-soluble nitrate compound, and a water-soluble peroxy compound, said solution containing a sufficient amount of said oxalate compound to provide about 0.125 to 0.65 gram mole per liter of the oxalate radical, a sufficient amount of said nitrate compound to provide at least about 0.004 gram mole per liter of the nitrate radical, and a sufficient amount of said peroxy compound to provide 0.001 to 0.05 gram mole per liter of the peroxy group;

(b) introducing into the container of a mass finishing unit a mass of elements comprising of a quantity of objects with metal surfaces;

(c) wetting said mass of elements with said solution;

(d) rapidly agitating said mass of elements while maintaining said surfaces in a wetted condition with said solution, said agitation producing relative movement and contact among said elements; and

(e) continuing said agitation step for a period sufficient to effect a significant reduction in roughness of said surfaces.

4,705,595

METHOD FOR MICROWAVE PLASMA PROCESSING

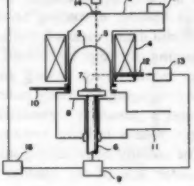
Sadayuki Okudaira, Ome; Shigeru Nishimatsu, Kokubunji; Keizo Suzuki, Kodaira; Ken Ninomiya, Hachioji, and Ryoji Hamazaki, Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,314

Claims priority, application Japan, Nov. 9, 1984, 59-234918

Int. Cl.[4] B44C *1/22*

U.S. Cl. 156—643 10 Claims



1. A method for microwave plasma processing of a sample, having an electrically conductive material layer provided on a substrate, said electrically conductive material layer being made of at least one material selected from the group consisting of silicon, metal and silicide, the method comprising the steps of:

forming a discharge space by introducing a microwave into

a vacuum chamber into which discharge gases, suitable for etching have been introduced, to thereby change said discharge gases to plasma; and applying a radio-frequency voltage to a sample stage provided in said vacuum chamber for holding said sample to be processed by etching said plasma; wherein said step of applying said radio-frequency voltage includes applying said radio-frequency voltage only for a period of time from initiation of plasma processing of said sample until a surface oxide film of the portion of said electrically conductive material layer to be etched is removed.

4,705,596

SIMULTANEOUS PLASMA SCULPTURING AND DUAL TAPERED APERTURE ETCH

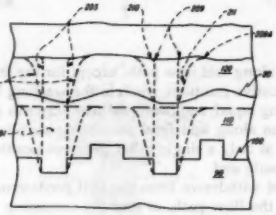
George E. Gimpelson, Indialantic; Cheryl L. Holbrook, and Frederick N. Hause, both of Palm Bay, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Apr. 15, 1985, Ser. No. 723,238

The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.

Int. Cl.[4] H01L *21/308, 21/32;* **B44L** *1/22*

U.S. Cl. 156—643 **12 Claims**



1. A method of forming apertures having a dual tapered characteristic without requiring extra process steps comprising:

forming a first layer of a first material over at least a portion of a second layer of a second material,

providing an RIE faceted opening through said first layer,

forming an aperture through said second layer using a anisotropic plasma etch which etches said second layer at a different rate that it etches said first layer such that said aperture through said second layer has tapered sidewalls.

4,705,597

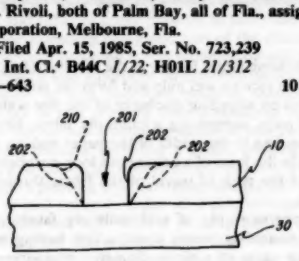
PHOTORESIST TAPERING PROCESS

George E. Gimpelson, Indialantic; Cheryl L. Holbrook, and Anthony L. Rivoli, both of Palm Bay, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Apr. 15, 1985, Ser. No. 723,239

Int. Cl.[4] B44C *1/22;* **H01L** *21/312*

U.S. Cl. 156—643 **10 Claims**



1. A method of forming a tapered aperture in a photoresist mask layer comprising the steps of:

creating an aperture having a substantially vertical sidewall in said photoresist mask layer,

said sidewall having a peripheral edge,

pretreating said photoresist mask layer by exposing said photoresist mask layer to a source of wideband light followed by heating to round said pheripheral edge while retaining said substantially vertical sidewall, and thereafter,

exposing said peripheral edge and said substantially vertical sidewall to a plasma whereby the plasma etches said photoresist mask layer along a preferred facet to convert said aperture having a substantially vertical sidewall to an aperture having a tapered sidewall.

4,705,598

METHOD OF PRODUCING PHOTOSENSOR

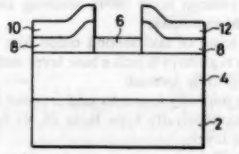
Satoshi Itabashi, Atsugu; Soichiro Kawakami; Katsunori Terada, both of Sagamihara; Hideyuki Suzuki, Machida; Teruhiko Furushima, Hiratsuka, and Masaki Fukaya, Isehara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 21, 1987, Ser. No. 5,850

Claims priority, application Japan, Jan. 27, 1986, 61-13783

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C23F** *1/02*

U.S. Cl. 156—643 **3 Claims**



1. A method of producing a photosensor having a photoconductive layer and a pair of electrodes provided through an ohmic contact layer on the same surface of said photoconductive layer for applying a voltage to said photoconductive layer, comprising the steps of:

forming an insulating layer on one surface of said photoconductive layer except at portions where said pair of electrodes is to be formed;

forming a layer of an ohmic contact layer forming material on said insulating layer;

forming a layer of an electrode forming material on said layer of an ohmic contact layer forming material; and

removing said electrode forming material except at the portions where said pair of electrodes is to be formed, and said ohmic contact layer forming material.

4,705,599

METHOD FOR FABRICATING BIPOLAR TRANSISTOR IN INTEGRATED CIRCUIT

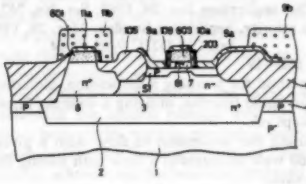
Kakutaro Suda, and Tadashi Hirao, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1986, Ser. No. 900,444

Claims priority, application Japan, Aug. 28, 1985, 60-191013

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—653 **2 Claims**



1. A method for fabricating a bipolar transistor, comprising the steps of:

preparing a collector layer (3, 8) of a first conductivity type

surrounded by an isolation oxide layer (102) on a semiconductor substrate;

forming a multilayered film pattern by etching with a photoresist layer mask (303) thereon, said multilayered film including a polysilicon layer (600), a nitride layer (202) and an oxide layer (104) stacked in this order on said collector layer (3, 8);

retracting said oxide layer (104) into between said nitride layer (202) and said photoresist layer (303) by side etching;

selectively forming a first oxide film (105) on said collector layer (3, 8), utilizing said nitride layer (202) as a mask;

etching down through said nitride layer (202) and said polysilicon layer (600) to a prescribed depth of said collector layer (3, 8) by anisotropic etching, utilizing both said side-etched oxide layer (104) and said first oxide film (105) as a mask;

forming a second oxide film (106) on the etched and exposed surface area between said nitride layer region (202) and said first oxide film region (105);

removing said nitride layer (202);

introducing an impurity of said first conductivity type into said polysilicon layer (600), utilizing said second oxide film (106) as a mask;

removing some of said second oxide film regions (106) to expose a regions in which a base layer and an emitter layer are going to be formed;

implanting impurity ions into said exposed region to form a second conductivity type layer (5, 6) for implementing said base layer;

implanting silicon ions into not only said exposed region but also predetermined regions of said first oxide film (105), said predetermined regions neighboring on said exposed region;

subjecting said substrate to a heat treatment to complete said base layer (51, 61) by annealing said second conductivity type layer (5, 6) and simultaneously forming an emitter layer (7) by diffusion of said first conductivity type impurity from one (602) of said polysilicon layer regions;

subjecting said substrate to an oxidation treatment at a relatively lower temperature to cover said exposed region with an oxide film (107, 108, 109), followed by formation of a nitride film (203) thereover to provide a double-layered insulator film;

anisotropically etching said double-layered insulator film to leave it only on said side walls of both said emitter layer (7) and said polysilicon layer (603) thereon; and

forming a base electrode (9*a*) and an emitter electrode (10*a*) on said silicon-implanted region, which are made of a metal silicide and insulated from each other by said double-layered insulator film (109, 203).

4,705,600

METHOD FOR THE TREATMENT OF PULP WITH LIQUID

Finn Jacobsen, Karlstad, Sweden, assignor to Kamyr AB, Karlstad, Sweden

Continuation of Ser. No. 477,854, Mar. 22, 1983, abandoned. This application Jun. 24, 1985, Ser. No. 747,873

Claims priority, application Sweden, Mar. 29, 1982, 8201973

Int. Cl.[4] D21C *9/02, 9/04*

U.S. Cl. 162—19 **19 Claims**

1. A method for washing a suspension, including an initial suspension liquid fraction, utilizing a washing liquid, comprising the steps of:

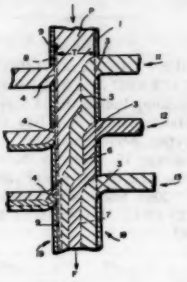
(a) causing the suspension to flow with a given predetermined web thickness in a flow path having first and second sides;

(b) adding washing liquid to the suspension flowing in the flow path from the first side thereof at a first predetermined position along the flow path;

(c) at substantially said first predetermined position along the flow path withdrawing from the second side of the flow path initial suspension liquid displaced by said washing liquid;

(d) repeating steps (b) and (c) at a plurality of other predetermined spaced consecutive positions along said flow path;

the washing liquid added at the first predetermined position in step (b), and at the other positions along said flow path, being supplied by withdrawn wash liquid withdrawn from a position at least two of said consecutive positions further



down along said flow path, except for the last two of said consecutive positions wherein the washing liquid is fresh washing liquid; and the liquid withdrawn at any particular position along said flow path being supplied as washing liquid at only a single other previous position along said flow path; and

the liquid withdrawn from the first predetermined position along the flow path, in step (c), consisting essentially of initial suspension liquid.

4,705,601

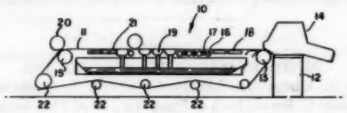
MULTI-PLY PAPER FORMING FABRIC WITH OVATE WARP YARNS IN LOWERMOST PLY

Kai F. Chiu, Brandon, Miss., assignor to B.I. Industries, Inc., Florence, Miss.

Filed Feb. 5, 1987, Ser. No. 11,008

Int. Cl.[4] D21F *1/10, 7/08;* **D03D** *15/00*

U.S. Cl. 162—348 **5 Claims**



1. A forming fabric for use at the wet end of a paper making machine to receive wet pulp and form the same into a consolidated web by affording discharge of the free water content of the wet pulp, comprising a multi-ply fabric having a width corresponding to the width of the paper making machine and a length in the form of a continuous loop corresponding to the length of the path of travel of the fabric through the paper machine,

the uppermost ply of said multi-ply fabric comprising a self-sustaining weave construction having monofilament warp yarns of a given diameter interwoven with shute yarns in a weave pattern selected to produce the desired surface texture in the paper produced from the web formed on said fabric,

the lowermost ply of said multi-ply fabric comprising a series of generally ovate warp yarns having a vertical dimension in the range of 1.0 to 1.5 times the diameter of the warp yarns of the uppermost ply, and shute yarns interwoven with said ovate warp yarns to produce a

self-sustaining fabric construction which is characterized by a high degree of porosity without substantial voids,

said ovate warp yarns in the lower ply having a horizontal width in the shute direction substantially greater than said vertical dimension, and

binder shute yarns interconnecting the upper and lower plies, and being interwoven with the upper ply adjacent to a shute yarn of the upper ply at a point where said shute yarn passes over a warp yarn of said upper ply, and being interwoven with the lower ply adjacent a shute yarn of the lower ply at a point where said shute yarn of the lower ply passes under an ovate warp yarn of the lower ply.

4,705,602

HYDRAULIC PRESSING SHOE WITH AN ADJUSTABLE CIRCUMFERENTIAL PRESS ZONE

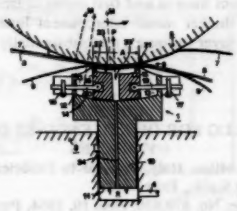
Hans K. Dahl, Ravensburg, Fed. Rep. of Germany, assignor to Sulzer-Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Nov. 25, 1985, Ser. No. 801,626

Claims priority, application Switzerland, Dec. 21, 1984, 6120/84

Int. Cl.[4] D21F *3/06, 3/00*

U.S. Cl. 162—358 **11 Claims**



1. In a pressing machine including a roller, pressing shoe means presenting to said roller a substantially concave surface structured to form a pressing zone extending along a part of the circumference of said roller in order to define between said pressing shoe means and said roller a pressing gap to which pressure can be applied, said pressing shoe means comprising means defining at least one pressure chamber, means for connecting said pressure chamber to a source of hydraulic pressure medium, said pressing shoe means including a pressing shoe mounted in said pressure chamber and defining an adjustable circumferential length determining the length of said pressing zone along said part of the circumference of said roller, said pressing shoe in its operative position being arranged to be urged by said hydraulic pressure medium towards and away from said roller to apply pressure to said roller over said pressing zone extending along said part of the circumference of said roller, and adjusting means mounted on said pressing shoe for adjusting said adjustable circumferential length of said pressing shoe in said operative position thereof and thereby the length of said pressing zone determined by said pressing shoe in the circumferential direction of said roller.

8. In a pressing machine including a roller, pressing shoe means presenting to said roller a substantially concave surface structured to form a pressing zone extending along a part of the circumference of said roller in order to define between said pressing shoe means and said roller a pressing gap to which pressure can be applied, said pressing shoe means comprising means defining a plurality of pressure chambers, a pressing shoe, base parts of said pressing shoe, each such part being mounted in a respective pressure chamber, means connecting each said pressure chamber to a source of hydraulic pressure medium, whereby said pressing shoe can be urged towards and away from said roller, at least two jaws mounted in said pressing shoe and movable in the circumferential direction of said roller to establish said pressing zone extending along said part of the circumference of said roller and via which pressing zone pressure can be applied to said roller upon movement of said pressing shoe towards said roller, and means for moving at least one of said jaws to alter the length of said pressing zone formed by said pressing shoe means in the circumferential direction of said roller.

4,705,603

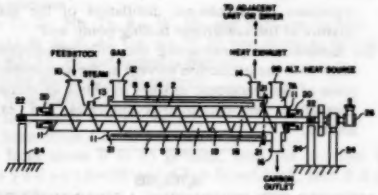
PYROLYTIC APPARATUS

Roger B. McMullen; Dillon G. McMullen, and Frederick G. McMullen, all of P.O. Box 396, Gwynedd Valley, Pa. 19437

Filed Apr. 7, 1986, Ser. No. 848,968

Int. Cl.[4] C10B *1/06*

U.S. Cl. 202—109 **6 Claims**



1. Pyrolytic apparatus for pyrolyzing a carbonaceous feedstock, comprising:

a plurality of tubes formed of a material a high thermal conductivity for providing a heat sink and concentrically arranged to provide a plurality of longitudinally extending annular passages;

sealing members extending between the ends of adjacent tubes for enclosing each of the plurality of annular passages; the innermost tube defining a first of said passages for pyrolyzing a carbonaceous feedstock to produce a gaseous pyrolytic product and a solid pyrolytic residue;

a feedstock inlet member connected to an upstream end of the first passage for introducing a carbonaceous feedstock thereto;

means disposed within the first passage for conveying the feedstock therein from said upstream end to a downstream end;

a residue outlet member connected to the downstream end of the first passage for removing the solid pyrolytic residue therefrom;

a second of said annular passages surrounding the first passage, and means for supplying a heat carrier to the second passage;

a third of said annular passages surrounding the second passage, means connecting the first passage with the third passage and a product gas outlet member connected to the third passage thereby forming an outlet passage for the gaseous pyrolytic product; and

a fourth of said passages surrounding the third passage, means connecting the second passage with the fourth passage and a heat carrier exhaust member connected to the fourth passage thereby forming an exhaust passage for the heat carrier, wherein said feedstock is pyrolyzed in the first passage by heat transfer from the heat carrier supplied to the second passage and the gaseous pyrolytic product is cracked in the third passage by heat transfer from the heat carrier supplied to the second passage and from the heat carrier exhausted from the fourth passage.

4,705,604

PROCESS FOR EXTRACTING POLY-BETA-HYDROXYBUTYRATES BY MEANS OF A SOLVENT FROM AN AQUEOUS SUSPENSION OF MICROORGANISMS

Noël Vanlautem, Wavre, and Jacques Gilain, Brussels, both of Belgium, assignors to Solvay & Cie. (Société Anonyme), Brussels, Belgium

Filed Jun. 19, 1985, Ser. No. 746,381
Claims priority, application France, Jul. 6, 1984, 84 10921
Int. Cl.[4] B01D *3/36*; C07C *69/66*; C08G *63/06*
U.S. Cl. 203—67 12 Claims

1. A solvent extraction process for extracting poly-beta-hydroxybutrates from an aqueous suspension of micro-organisms containing poly-beta-hydroxybutrates, the process comprising:

(a) contacting the aqueous suspension of micro-organisms with a selected extraction solvent for poly-beta-hydroxybutyrates, which extraction solvent forms a minimum boiling azeotropic mixture with water, and which azeotropic mixture has an azeotropic boiling point;

(b) removing water from the aqueous suspension of micro-organisms by azeotropic distillation of the azeotropic mixture at the azeotropic boiling point; and

(c) simultaneously extracting the poly-beta-hydroxybutyrates with the extraction solvent at the azeotropic boiling point of the azeotropic mixture to obtain an extract phase containing poly-beta-hydroxybutyrates and extraction solvent.

4,705,605

METHOD FOR PRODUCING A SPINNING NOZZLE PLATE

Erwin Becker; Wolfgang Ehrfeld, both of Karlsruhe, and Peter Hagmann, Leopoldshafen, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed May 16, 1986, Ser. No. 863,989
Claims priority, application Fed. Rep. of Germany, May 17, 1985, 3517730
Int. Cl.[4] C25D *1/08*
U.S. Cl. 204—11 19 Claims

1. A method for producing a spinning nozzle plate having nozzle capillaries, comprising the steps of:

(a) depositing a layer of resist material on a galvanic electrode by pouring on a methacrylate based casting resin PMMA which subsequently hardens, the resist material having positive resist characteristics which are changed by high-energy radiation;

(b) producing negatives of the nozzle capillaries on the galvanic electrode by irradiating the layer of resist material in a predetermined pattern, using X-ray radiation generated by an electron synchrotron, and thereafter selectively removing the irradiated resist material by development with a liquid developer while utilizing differences in the characteristics thereof produced by the irradiation;

(c) producing a galvanic layer which encloses the negatives of the nozzle capillaries on the galvanic electrode;

(d) removing the negatives of the nozzle capillaries; and

(e) removing at least part of the galvanic electrode.

4,705,606

THIN-FILM ELECTRICAL CONNECTIONS FOR INTEGRATED CIRCUITS

Peter L. Young, South Barrington; Jay Cech, Elmhurst, and Kin Li, Lombard, all of Ill., assignors to Gould Inc.

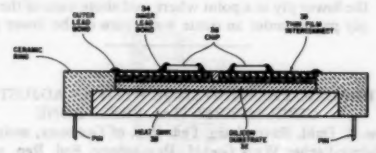
Filed Jan. 31, 1985, Ser. No. 697,092
Int. Cl.[4] C25D *5/02*
U.S. Cl. 204—15 16 Claims

1. A method of fabricating thin-film interconnect signal planes for connecting semiconductor integrated circuits comprising the steps of:

forming a first pattern of thin-film metallic interconnect lines on a first surface of a substrate;

forming a first dielectric layer on the entire area of said first surface of said substrate covering said first pattern of thin-film metallic interconnect lines;

removing a portion of said first dielectric layer from said



substrate in areas which cover said first thin-film metallic interconnect lines to form a first series of trenches above each interconnect line; and

electroplating said first pattern of thin-film metallic interconnect lines to form a first series of thicker metal interconnect lines on top of said first pattern of thin-film metallic interconnect lines in said first series of trenches, said first series of thicker metal interconnect lines and said first dielectric layer forming a first substantially planer surface.

4,705,607

GLOW PLUG FOR DIESEL ENGINES OF MOTOR VEHICLES

Gilberto Izzi, Milan, Italy, assignor to Fabbrica Italiana Magneti Marelli S.p.A., Italy

Division of Ser. No. 679,830, Dec. 10, 1984, Pat. No. 4,582,960.
This application Nov. 27, 1985, Ser. No. 802,268
Claims priority, application Italy, Mar. 9, 1984, 19959 A/84
Int. Cl.[4] C25D *5/02*
U.S. Cl. 204—15 6 Claims

1. A process for manufacturing an electric filament spiral for a glow plug, which spiral includes an initial length (L_1) extending from a location at which a current feeder is to be connected and an end length (L_2) remote from the location at which a current feeder is to be connected, said process being characterized by the following steps:

(a) coating said end length (L_2) with a layer of electrically insulating coating material;

(b) thereafter treating said spiral in a galvanic plating bath containing salts of the coating metal, to provide an electrochemical deposit of a selected metal only on the unprotected initial length (L_1) of the spiral; and

(c) thereafter removing the layer of insulating coating material from said end length (L_2) of the spiral to provide a spiral coated only on the initial length (L_1).

4,705,608

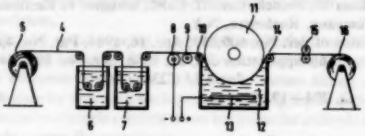
PROCESS FOR MAKING SCREEN PRINTING FABRICS FOR SCREEN PRINTING CYLINDERS

Heinz Keller; Heinz Brocker, and Martin Lehner, all of St. Gall, Switzerland, assignors to Ferd Ruesch AG, St. Gall, Switzerland

Filed Oct. 13, 1985, Ser. No. 797,640
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1984, 3441593
Int. Cl.[4] C25D *7/00*
U.S. Cl. 204—28 11 Claims

1. Process for making photochemically coated screen printing fabrics for the production of screen printing cylinders, consisting of a chromium steel wire fabric, characterized in

that the chromium steel wire fabric is nickel-plated, and an even sensitive layer consisting of at least one layer of photosen-



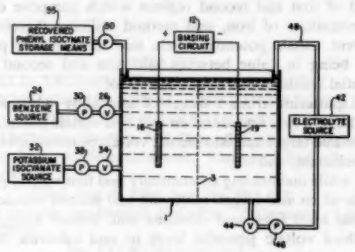
sitive emulsion is applied to one side of the nickel-plated chromium steel wire fabric.

4,705,609

METHOD FOR DERIVING PHENYL ISOCYANATE FROM BENZENE AND POTASSIUM ISOCYANATE

Ronald L. Cook, 4260 Westbrook Dr. No. 111, Aurora, Ill. 60505

Filed Nov. 13, 1986, Ser. No. 929,868
Int. Cl.[4] C25C *3/00*
U.S. Cl. 204—59 R **6 Claims**



1. A method of deriving phenyl isocyanate comprising the steps of:
providing an electrolyte,
separating the electrolyte solution with an ion transferrable membrane so as to form a catholyte solution and an anolyte solution from the electrolyte,
placing a cathode in the catholyte and an anode in the anolyte,
providing benzene to the anolyte,
providing solubilized OCN^-, through the use of (18-crown-$6K^+$)OCN^-, to the anolyte, and
providing an electrical voltage across the cathode and the anode so as to cause a reaction of the benzene, OCN^- to yield phenyl isocyanate.

4,705,610

ANODES CONTAINING IRIDIUM BASED AMORPHOUS METAL ALLOYS AND USE THEREOF AS HALOGEN ELECTRODES

Michael A. Tenhover, Solon; Jonathan H. Harris, Shaker Heights, and Robert K. Grasselli, Aurora, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 747,996, Jun. 24, 1985, abandoned. This application May 27, 1986, Ser. No. 867,782
Int. Cl.[4] C25B *1/24*
U.S. Cl. 204—95 **22 Claims**

1. An anode comprising:
a substrate material; and
an iridium based amorphous metal alloy coating on said substrate having the formula

$$Ir_iY_yD_dE_eF_f \qquad II$$

where
Y is yttriumi
D is Ti, Zr, Nb, Ta, Ru, W, Mo and mixtures thereof;
E is C, B, Si, P, Al, Ge, As, N, Sb and mixtures thereof;
F is Rh, Pt, Pd and mixtures thereof;
i is from about 50 to 96 percent;
y is from about 4 to 40 percent;
d is from about 0 to 40 percent;
e is from about 4 to 40 percent;
f is from about 0 to 45 percent;
with the provisos that $i+y+d+e+f=100$ and if E is Si and/or P, then B is also present;
said anode having a corrosion rate of less than 10 microns/-year as measured in a 1 to 4M NaCl solution at a current density of from about 100 to 300 mA/cm^2.

17. A process for the generation of halogens from halide-containing solutions comprising the step of:
conducting electrolysis of said solutions in an electrolytic cell having an iridium based amorphous metal anode selected from the group consisting of $Ir_iY_yD_dE_eF_f$ alloys

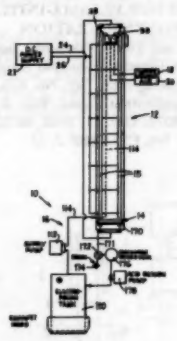
where
Y is yttriumi
D is Ti, Zr, Nb, Ta, Ru, W, Mo and mixtures thereof;
E is C, B, Si, P, Al, Ge, As, N, Sb and mixtures thereof;
F is Rh, Pt, Pd and mixtures thereof;
i is from about 50 to 96 percent;
y is from about 4 to 40 percent;
d is from about 0 to 40 percent;
e is from about 4 to 40 percent;
f is from about 0 to 45 percent; with the provisos that $i+y+d+e+f=100$ and if E is Si and/or P, then B is also present.

4,705,611

METHOD FOR INTERNALLY ELECTROPOLISHING TUBES

Thomas L. Grimes; Robert Roeland, both of Kalamazoo, and Frederic H. Schadewald, Richland, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 636,198, Jul. 31, 1984, Pat. No. 4,601,802. This application Apr. 7, 1986, Ser. No. 848,885
Int. Cl.[4] C25F *3/24*
U.S. Cl. 204—129.1 **10 Claims**



1. A method for electropolishing the interior of elongate tubes comprising:
preselecting electrolyte type, temperature and flow rate, along with tube rotation speed and DC supply voltage;
locating a plurality of table sections in end-to-end relation;
laying a tube to be electropolished on a plurality of conductive crossbars fixed to and distributed along the lengths of the table sections;

axially shifting said tube in a downstream direction through a rotatably drivable chuck on the downstream one of said table sections and tightening said chuck on said tube to enable rotative driving of said tube;

axially inserting partial length cathode rods substantially coaxially into the inlet and outlet ends of said tube, while inserting into said tube spacers spaced along said cathode rods and installing on the ends of said tube end caps carried by said cathode rods;

securing said tube to said crossbars in relatively rotatable but electric current conducting relation;

rotationally driving said tube at said chuck;

forcing electrolyte liquid through said inlet end cap, flowing said liquid through the length of the tube and along same to overflow a dam at the outlet end of the tube while maintaining the cathode rod immersed in said liquid, applying positive and negative electrical connections to said crossbars and the protruding ends of said partial length cathode rods for a selected time to electropolish the interior of said tube while collecting electrolyte liquid overflowing from the dammed outlet end of the tube and recycling same through a loop for introduction at the inlet end of the tube;

upon completion of electropolishing, terminating electrolyte supply to the inlet and of the tube, removing said outlet dam from the outlet end of said tube, and sequentially supplying a rinse liquid and a drying gas to flow from the inlet end of the tube out the outlet end thereof to remove residual electrolyte liquid and any products of electropolishing from the tube;

stopping said rotational drive and releasing the outlet end of the tube from clamped relation in said chuck;

removing said end caps and cathode rods from the tube, unclamping said tube from said table and raising the upstream end of the tube to tilt the tube somewhat and further rinsing the tube while tilted;

diverting rinse liquid out of the electrolyte liquid loop to a suitable drain.

4,705,612

METHOD FOR PLASMA-INITIATED POLYMERIZATION

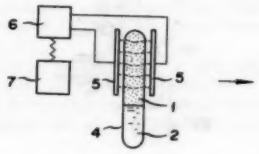
Takeshi Shimomura, and Tohru Takahashi, both of Fujinomiya, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1986, Ser. No. 826,579

Claims priority, application Japan, Feb. 8, 1985, 60-22001; Jun. 28, 1985, 60-140574; Oct. 11, 1985, 60-224892

Int. Cl.[4] C08F *2/52*

U.S. Cl. 204—165 **21 Claims**



1. A method for plasma-initiated polymerization by the steps of exposing a vapor phase containing monomer vapor to a plasma and introducing a polymerization initiating active seed consequently produced into a condensate phase of monomer thereby effecting chain-growth polymerization of said monomer, which method is characterized by effecting the production of a polymer while keeping a radical polymerization initiator present at least in said vapor phase.

4,705,613

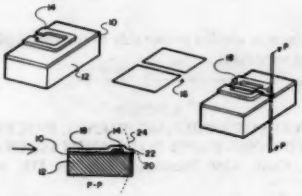
SPUTTERING METHOD OF MAKING THIN FILM HEAD HAVING IMPROVED SATURATION MAGNETIZATION

William W. French, Cardiff, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 600,857, Apr. 16, 1984, Pat. No. 4,631,613. This application Jul. 28, 1986, Ser. No. 890,214

Int. Cl.[4] C23C *14/34*

U.S. Cl. 204—192.2 **4 Claims**



1. The method of forming on a substrate an improved thin film of an alloy of silicon, aluminum and iron, said film being useful in the formation of a magnetic head, and being comprised of first and second regions which comprise different concentrations of iron, said method utilizing therefor three different voltaic potential levels, said third voltaic potential level being in value between said first and second voltaic potential levels, comprising the steps of

(a) sputtering from a target of said alloy while applying duringa first time duration said first voltaic potential level to said target and said second voltaic potential level to said substrate, and

(b) while maintaining substantially said first voltaic potential level on said target, removing said second voltaic potential level from said substrate and, instead applying said third voltaic potential level to said substrate during a second time duration, thereby to cause re-sputtering from said thin film to leave that part of said thin film which is subject to re-sputtering comparatively rich in iron.

4,705,614

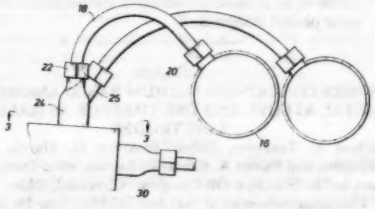
CELL WITH IMPROVED ELECTROLYTE FLOW DISTRIBUTOR

Gregory J. E. Morris, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 12, 1986, Ser. No. 861,801

Int. Cl.[4] C25B *9/00, 15/08*

U.S. Cl. 204—257 **13 Claims**



1. For use in an electrolytic cell having a central membrane dividing the cell into cathode and anode regions wherein cathode and anode electrodes are placed on opposite sides of the membrane, a cell construction comprising:

(a) a catholyte flow means opening from the cathode side of the cell;

(b) an anolyte flow means opening from the anode side of the cell;

(c) wherein said flow means are respectively located in

operative communication with the cathode and anode compartments within the cell;

(d) a top and walls forming the cell and defining a relatively narrow dimension across the top perpendicular to the membrane;

(e) elliptical nozzle means connected on both sides of the membrane to aid in flow of catholyte and anolyte gases and effluents of the cell, said nozzle means aiding cell operation by reducing back pressure during liquid and gas removal as electric current flows between the cathode and anode across the membrane;

(f) wherein said nozzle means includes a fitting external to said cell, said fitting connected serially with said nozzle means;

(g) an externally located gas collection header means adjacent to said cell located such that header means does not pass over the top of said cell; and

(h) curving lateral lines extending from said header and effluent removal for operation of said cell.

4,705,615

ELECTRODE ARRANGEMENT FOR THE ELECTROCHEMICAL METAL EROSION PROCESS FOR PRODUCING A TOOTH SYSTEM

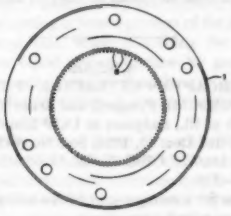
Gerhard Hoffmann, Berglen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 5, 1986, Ser. No. 893,212

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1985, 3528056

Int. Cl.⁴ B23H *3/04, 9/12*

U.S. Cl. 204—289 **14 Claims**



1. Electrode arrangement for the electrochemical metal erosion process (ECM process) for producing a tooth system on a blank, having a metal plate extending transversely to a sinking direction and perforated in conformity with the tooth system to be produced, and a resiliently attached insulator ring which presses protectively against the crests of the resulting teeth during the sinking, wherein the metal plate is provided with a ring of tongues, the length of which is dimensioned so that a gap of 1 to 2 mm is produced between the addendum circle diameter of the tooth system and the dedendum circle diameter of the tongue ring, and that the root of the tongues is braced by an at least two-part compression-resistant insulator ring which is arranged radidlly resiliently and presses against the crests of the resulting teeth on said blank and the inside radius of said ring differs by a maximum of 0.01 mm from the addendum circle diameter of the tooth system to be sunk, said ring being ground to a surface roughness depth of R_z6.3 or better, and the circumferential edges of said ring of which are sharp-edged.

4,705,616

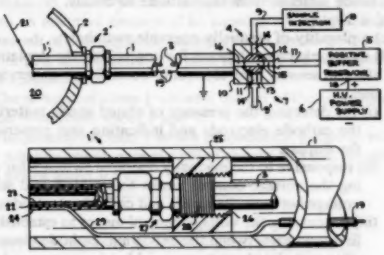
ELECTROPHORESIS-MASS SPECTROMETRY PROBE

Brian D. Andresen, Pleasanton, and Eric R. Fought, Livermore, both of Calif., assignors to Sepragen Corporation, San Leandro, Calif.

Filed Sep. 15, 1986, Ser. No. 906,847

Int. Cl.⁴ G01N *24/00, 24/04, 27/26;* **H01J** *49/00*

U.S. Cl. 204—299 R **28 Claims**



1. An electrophoretic mass spectrometric process in which chemical components are separated from complex mixtures and analyzed in real-time to yield molecular weights and structural information of the electrophoretically separated chemicals, the process comprising the steps of:

directing a quantity of electrically conducting buffer material into a capillary tube;

directing a mixture to be separated and analyzed into the buffer material in the capillary tube;

impressing an electrical potential on said capillary tube;

separating chemicals from the mixture by electrophoresis as the mixture migrates along the interior of the capillary;

discharging the separated chemicals directly from the capillary tube into an ion source of a mass spectrometer;

directing an ionizing beam onto the separated chemicals as the separated chemicals discharge from the capillary tube for ionizing the chemicals, and

analyzing the ionized chemicals in the mass spectrometer.

4,705,617

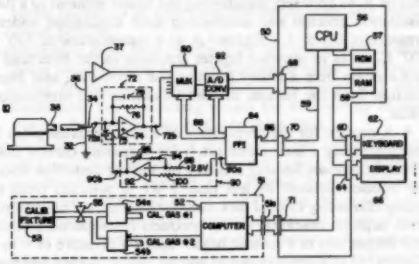
APPARATUS FOR DEPLATING CUTANEOUS GAS SENSORS

Cedric H. Beebe, Fullerton; Larry S. McDavid, Anaheim, and Michael Pawlowski, Chino, all of Calif., assignors to Sensormedics Corporation, Anaheim, Calif.

Filed May 6, 1983, Ser. No. 492,108

Int. Cl.⁴ G01N *27/46;* **G12B** *13/00*

U.S. Cl. 204—402 **22 Claims**



1. A deplating apparatus for a cutaneous gas sensor of the type having a gas permeable membrane, a housing defining an electrolyte chamber for receiving an electrolyte solution, an

anode electrode and a cathode electrode within the electrolyte chamber, said cathode electrode being located adjacent to the gas permeable membrane, characterized by:

(a) voltage control means for selectably establishing first and second voltages between the anode and cathode electrodes, said first voltage having a magnitude and polarity which promotes the reduction of oxygen molecules at the cathode electrode, and said second voltage having a magnitude and polarity which promotes the deplating of anode material from the cathode electrode,

(b) a display,

(c) a plurality of manually operable switches,

(d) electronic control means for controlling the deplating of the gas sensor, said electronic control means serving as means:

(i) for detecting the presence of plated anode material on the cathode electrode and indicating said presence on the display,

(ii) responsive to the manually operable switches for causing the voltage control means to establish said second voltage between the anode and cathode electrodes, and

(iii) for causing the voltage control means to establish said first voltage between the anode and cathode electrodes after said plated anode material has been removed from the cathode electrode,

(e) means for connecting the electronic control means to the voltage control means,

(f) means for connecting the voltage control means to the gas sensor, and

(g) means for connecting the gas sensor to the electronic control means.

4,705,618

PROCESS FOR THE PREPARATION OF AN INTERMEDIATE PITCH FOR MANUFACTURING CARBON PRODUCTS

Masatoshi Tsuchitani, and Ryoichi Nakajima, both of Ichihara, Japan, assignors to Maruzen Petrochemical Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1986, Ser. No. 849,568
Int. Cl.[4] C10C *3/02, 3/00;* **D01F** *9/12*
U.S. Cl. 208—44 **7 Claims**

1. A process for the continuous preparation of an almost optically isotropic and substantially homogeneous intermediate pitch with a benzene isoluble fraction content of more than 50 wt %, a quinoline insoluble fraction content of less than 30 wt % and a beta-resins content of more than 40 wt % for manufacturing a mesophase pitch for preparing carbon fibers which comprises heating a heavy oil having a quinoline insoluble fraction content of less than 5 wt % selected from the group consisting of coal tars, coal tar pitches, tar by-products from naptha cracking, tar by-products from gas oil cracking and decant oils, in a tubular heater under a pressure of 4 to 50 $Kg/cm^2.G$ at a temperature of 400° to 520° C. with a residence time of 30 to 1000 sec; transferring the heater effluent to a flash distillation column and conducting flash distillation under a pressure of 0.3 to 1.5 $Kg/cm^2.A$ at a temperature of 430° to 500° C. so as to separate lighter fractions as the overhead of said column from a heavy fraction and recovering said heavy fraction from the bottom of said column as said intermediate pitch.

4. A process for the preparation of a hydrogenated pitch for manufacturing a mesophase pitch for preparing carbon fibers which comprises heating a heavy oil having quinoline insoluble fraction content of less than 5 wt % selected from the group consisting of coal tars, coal tar pitches, tar by-products from naphtha cracking, tar by-products from gas oil cracking and decant oils in a tubular heater under a pressure of 4 to 50 $Kg/cm^2.G$ at a temperature of 400° to 520° C. with a residence time of 30 to 1000 seconds; transferring the heater effluent to a flash distillation column and conducting a flash distillation under a pressure of 0.3 to 1.5 $Kg/cm^2.A$ at a temperature of 430° to 500° C. so as to separate lighter fractions as the overhead of said column from a heavy fraction; recovering said heavy fraction from the bottom of said column as an almost isotropic and substantially homogeneous intermediate pitch having a benzene insoluble fraction content of more than 50 wt %, a quinoline insoluble fraction content of less than 30 wt %, and a beta-resins content of more than 40 wt %, hydrogenating said intermediate pitch by using at least one compound selected from the group consisting of tetrahydroquinoline, hydrogenated naphthalene oil, hydrogenated anthracene oil, hydrogenated creosote oil and hydrogenated absorbing oil as a hydrogenating agent and a solvent, in an amount of 1 to 3 parts per 1 part of said intermediate pitch at a temperature of 380° to 480° C., under a presure of 20 to 50 $Kg/cm^2.G$ for 10 minutes to 5 hours and removing said hydrogenating agent and lighter fractions formed during the hydrogenation reaction.

4,705,619

HYDROPROCESSING WITH SELF-PROMOTED MOLYBDENUM AND TUNGSTEN SULFIDE CATALYST

Larry E. McCandlish, Highland Park, and Teh C. Ho, Bridgewater, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 687,579, Dec. 28, 1984, Pat. No. 4,663,023, which is a continuation-in-part of Ser. No. 595,991, Apr. 2, 1984, abandoned, which is a continuation of Ser. No. 454,386, Dec. 29, 1982, abandoned. This application Jan. 28, 1987, Ser. No. 7,765
Int. Cl.[4] C10G *45/08, 45/50, 47/04, 47/12*
U.S. Cl. 208—112 **15 Claims**

1. A hydroprocessing process comprising contacting a hydrocarbon feed at elevated temperature of at least about 100° C. and in the presence of hydrogen with a supported, self-promoted catalyst obtained by compositing one or more catalyst precursors of the formula (ML) $(Mo_yW_{1-y}O_4)$ with an inorganic refractory oxide support and heating said composition in a non-oxidizing atmosphere in the presence of sulfur at elevated temperature for a time sufficient to form said catalyst, wherein M comprises one or more divalent promoter metals, wherein y is any value ranging from 0 to 1, and wherein L is one or more, neutral, nitrogen-containing ligands at least one of which is a chelating polydentate ligand, said contacting occuring for a time sufficient to convert at least a portion of said feed.

4,705,620

MERCAPTAN EXTRACTION PROCESS

Jeffery C. Bricker, Mt. Prospect, and Bruce E. Staehle, Buffalo Grove, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 16, 1986, Ser. No. 942,147
Int. Cl.[4] C10G *19/00, 19/08, 45/00*
U.S. Cl. 208—206 **26 Claims**

1. A process for treating a sour hydrocarbon stream containing mercaptans which comprises:

(a) contacting said hydrocarbon stream with an aqueous alkaline solution in an extraction zone at treating conditions to form a purified hydrocarbon stream and a mercaptide rich aqueous alkaline solution;

(b) separating and recovering said purified hydrocarbon stream from said mercaptide rich aqueous alkaline solution:

(c) passing said mercaptide rich aqueous alkaline solution to an oxidation zone and therein treating said mercaptide rich aqueous alkaline solution with an oxidizing agent in the presence of a metal phthalocyanine oxidation catalyst at oxidation conditions to oxidize the mercaptides to liquid disulfides;

(d) separating a major portion of said liquid disulfides from said aqueous alkaline solution which contains residual disulfides in a separation zone;

(e) passing said residual disulfide containing aqueous alkaline solution to a reduction zone and reducing said residual disulfides to mercaptans at reduction conditions; and,

(f) recycling said mercaptan containing aqueous alkaline solution to said extraction zone.

4,705,621
CATALYTIC REACTOR SYSTEM WITH CROSSCURRENT LIQUID AND GASFLOW

Joe E. Penick, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 22, 1985, Ser. No. 714,776
Int. Cl.[4] B01J *8/08*
U.S. Cl. 208—146 **11 Claims**

1. In the process of treating a liquid hydrocarbon stream with a gaseous reactant stream in a porous bed of solid catalyst particles, an improved technique for maintaining uniform distribution of liquid and gas phases comprising:

containing the porous bed of solid particulates so as to define an upper and lower contact zone wherein said upper contact zone is defined by a primary bed surface sloping outwardly and downwardly from the upper contact zone toward the lower contact zone, and a secondary bed surface parallel to said primary bed surface, siad primary bed surface admitting at least a portion of the liquid stream into the porous bed, while permitting the unadmitted portion of the liquid stream to flow by gravity downwardly across said primary bed surface;

distributing the liquid stream at spaced points across said primary bed surface;

maintaining gravity flow of liquid through said porous bed;

introducing the gaseous stream to the contact zone through the primary bed surface and directing the gas flow toward the secondary bed surface transverse to liquid flow; and

recovering the treated hydrocarbon liquid and gas streams.

7. A multiphase cross-current catalytic reactor comprising

a reactor vessel having inlet means for liquid and gaseous reactant streams;

catalyst containment means within said reactor vessel for retaining a fixed porous bed of catalyst particles; said containment means comprising a plurality of foraminous side walls for admitting and removing reactant gas in crosscurrent flow transverse to gravitating liquid flow, where said foraminous side walls define an upper contact zone and a lower contact zone, wherein at least one of said foraminous side walls slopes outwardly and away from said upper zone to said lower zone;

liquid distributor means adapted for applying liquid reactant onto a top portion of said upper zone;

liquid projection means for distributing a reactant liquid stream onto said outwardly sloping foraminous surface whereby the liquid reactant stream passes through said foraminous side wall into the porous catalyst bed; and

means for recovering catalytically treated liquid from said porous bed.

4,705,622
PROCESS FOR DEDUSTING SHALE-OIL

Michael Siskin, Livingston; Glen B. Brons, Phillipsburg, both of N.J., and Gary S. Green, Groton, Conn., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Mar. 27, 1986, Ser. No. 844,831
Int. Cl.[4] C10G *29/06, 29/20, 29/00, 17/09*
U.S. Cl. 208—289 **12 Claims**

1. A process for removing entrained mineral matter particles from shale-oil, which process comprises contacting the shale-oil with an effective amount of an aqueous solution of an ammonium salt of a strong acid, having a pH in the range of about 0.5 to 8, at a temperature at which both the oil and aqueous phases remain liquid.

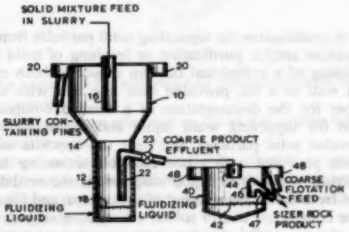
2. The process of claim 1 wherein the pH of the aqueous salt solution is between about 5 and 7.

5. The process of claim 1 which is conducted in two or more stages wherein one stage is at a pH of about 5 to 8 and the other is at a pH of about 0.5 to 5.

4,705,623
HYDROSIZING METHOD AND APPARATUS

Subrahmanyam Cheruvu, Mercerville, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 644,081, Aug. 24, 1984, abandoned. This application Dec. 4, 1985, Ser. No. 804,572
Int. Cl.[4] B03B *5/64, 5/66*
U.S. Cl. 209—161 **47 Claims**



1. Hydraulic classifying apparatus for separating particulate solids from a solid particle mixture into at least two groups based on the size and/or density of the particles comprising:

an upper vessel portion, adapted to be filled with liquid, for receiving a slurry containing said solid particle mixture,

a lower upright vessel portion having a constant cross-section area which is reduced in size from the cross sectional area of said upper vessel, and an upwardly diverging wall at the top thereof which is sealingly connected to the bottom of said upper vessel portion whereby said upper vessel portion is in fluid communication with said lower vessel portion,

a fludization zone being defined by the lower end of said lower vessel portion and a grid disposed within said lower vessel portion at a position above said lower end, said fluidization zone including means for introducing an upwardly-directed stream of fluidization fluid,

conduit discharge means for directing larger and/or denser solid particulate out of said apparatus which is mounted in said lower vessel portion, said conduit having a downwardly open first end which is positioned above said grid and an opened second end extending through a side of said lower vessel whereby larger and/or denser solid particulate which descends through an upwardly-directed stream of fluidization fluid is received by said first opened end and is directed out of said lower vessel portion though said second open end, and

second discharge means for removing smaller and/or less dense solid particulate mounted on said upper vessel por-

tion at aposition in which smaller and/or dense particulate containing slurry is didrected away.

4,705,624

APPARATUS AND PROCESS FOR SEPARATING SOLID PARTICLES FROM A LIQUID SUSPENSION AND/OR FOR THE PURIFICATION OR LEACHING OF SOLID PARTICLES

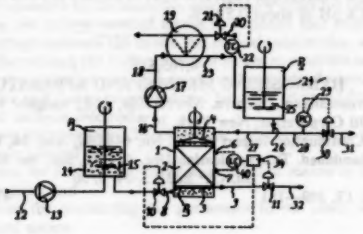
Henricus A. C. Thijssen, Son, Netherlands, assignor to Grasso's Koninklijke Machinefabrieken N.V., 's-Hertogenbosch, Netherlands

Filed Feb. 14, 1986, Ser. No. 829,163

Claims priority, application European Pat. Off., Feb. 15, 1985, 85200193.2

Int. Cl.[4] B01D *29/04, 35/00*

U.S. Cl. 210—96.1 17 Claims



1. A combination for separating solid particles from a liquid suspension and/or purification or leaching of solid particles, consisting of a cylindrical column closed at both ends by a fixed wall or a lid, provided near one end with a rotating scraper for the disintegration of a washed compacted bed, means for supplying wash liquid and means for removing suspended solid particles, and near the opposite end of the column provided with a non movable screening device for supplying pressurized liquid suspension, the withdrawal of liquid from the suspension out of the column and the transport of the compacted bed of solids, which screening device consists of two parallel circular plates mounted perpendicular to the axis of the column and having diameters equal to the inner diameter of the column of which part of the plate facing the scraper is permeable for liquid and not permeable for the suspended solids, where the other part of said plate contains channels which extend into the other parallel plate which channels are the inlet ducts supplying suspension, which channels have no open connections to the space enclosed by the two parallel plates and which channels have a diameter which is at least one order larger than the diameter of the perforations in the plate facing the scraper.

4,705,625

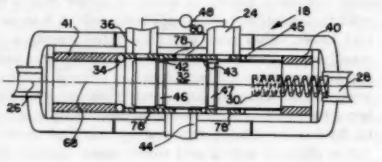
REVERSE OSMOSIS WATER PURIFYING SYSTEM

John E. Hart, Jr., 617 Eastview Rd., Largo, Fla. 33540

Filed Oct. 31, 1985, Ser. No. 793,198

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—110 4 Claims



3. In a reverse osmosis storage and recovery system including a R.O. module with a R.O. membrane therein, unpurified water being on an inlet side of said module and purified water on an opposite side thereof, said system including a container member having a slideably mounted piston member therein and said unpurified water being on opposite sides of said piston member, wherein the improvement comprises:

a control means having a second slideably mounted piston member positioned therein;

said control means having a first end in fluid communication with said unpurified water and having a second end in fluid communication with said purified water;

a bias means positioned within said control means, said bias means and pressure of said purified water combining to urge said control means piston member into an at rest position when said container member is full of purified water

the strength of said bias means being preselected so that said strength is insufficient to maintain said control means piston member in its at rest position when said container member is not full of purified water;

whereby a call for service effects unseating of said control means piston member from its at rest position by reducing the pressure of said purified water within said control means;

whereby said unseating of said control means piston member effects circulation of water through said system;

whereby a call for service that empties said system of purified water is operative to fully compress said bias means and to thereby position said closure means piston member in a position opposite to its at rest position;

wherein said control means includes a storage port means positioned mid-length of said control means, a bleed port means and a drain port means formed in said control means in circumferentially spaced and flanking relation to said storage port means, a plurality of O ring members that isolate said port means from one another, and wherein said control means piston member is provided with means defining a pair of spaced annular grooves formed therein that selectively align with preselected O ring members to control the circulation of water through said control means responsive to changes in condition of said system.

4,705,626

MAGNETIC OIL FILTER MODULE

Aldo Morelli, 25 Rockwood Ter., Jamaica Plain, Mass. 02130

Filed Mar. 19, 1986, Ser. No. 841,303

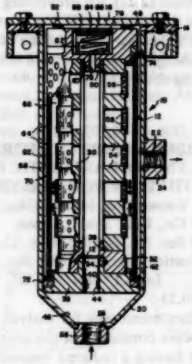
The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.

Int. Cl.[4] B01D *35/06, 27/10;* B03C *1/02*

U.S. Cl. 210—130 7 Claims

1. A filter module comprising a housing defining an enclosure, a filter element supported in the enclosure comprising an elongate cartridge of uniform cross section defining a chamber open at one end and closed at the other end, at least two slots longitudinally of the cartridge at diametrically-opposed sides of the longitudinal axis, a plurality of permanent magnets disposed about the cartridge in longitudinally-spaced relation, a plurality of non-magnetic spacers disposed about the cartridge between the permanent magnets, said spacers defining annular spaces circumferentially of the cartridge between magnets and containing openings in communication at their inner ends with said annular spaces and at their outer ends with the surrounding enclosure, a rigid, perforate sleeve disposed about the magnets and spacers of such cross section as to provide an annular gap between the perforate sleeve and the magnets and a porous fabric sleeve disposed in said gap in contact with the inner side of the perforate sleeve, means at

one end of the enclosure for delivering fluid into the open end of the cartridge and means intermediate the ends of the enclosure through which fluid passing through the filter can be withdrawn from the enclosure.



4,705,627

ABSORPTION APPARATUS INCLUDING ROTARY VALVE

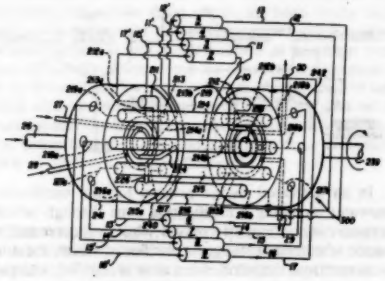
Kishio Miwa, Otsu; Makoto Kihara, Mishima; Kazuyuki Sakaya, and Takehisa Inoue, both of Kamakura, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 710,527, Mar. 12, 1985, abandoned, which is a continuation of Ser. No. 463,517, Feb. 3, 1983, abandoned. This application Sep. 29, 1986, Ser. No. 912,472

Claims priority, application Japan, Feb. 4, 1982, 57-16823; Apr. 26, 1982, 57-68783

Int. Cl.[4] B01D *15/00*; **B01J** *8/02*

U.S. Cl. 210—264 **2 Claims**



1. An adsorption-treating apparatus, comprising:

a plurality of adsorbent chambers, each charged with an adsorbent and altogether forming a desorption zone, a purification zone and an adsorption zone connected in series in that sequence; and

a rotay valve means for successively switching the supplying and drawing-out, to and from said chamber of a liquid to be treated in order to successively shift the desorption zone, the purification zone and the adsorption zone, in response to the rotation of said rotary valve means, wherein said rotary valve means includes,

a first stator,

a second stator, and

a rotor rotatably disposed between said first stator and said second stator, and wherein said rotor includes connecting passages for connecting each adjacent adsorbent chamber through said first stator, said rotor and said second stator, and L-shaped by-pass passages branched from portions of said connecting passages within said rotor, wherein said L-shaped bypass passages are connected with external liquid supply pipes through one of said first stator and said second stator or connected with external liquid draw-out pipes through one of said first stator and said second stator.

4,705,628

IMMUNOGLOBULIN ADSORBENT AND ADSORPTION APPARATUS

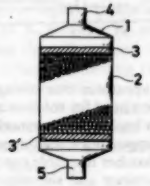
Yuichi Yamamoto, and Tadashi Sameshima, both of Fujinomiya, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1986, Ser. No. 849,068

Claims priority, application Japan, Apr. 9, 1985, 60-75148

Int. Cl.[4] B01D *15/00*

U.S. Cl. 210—289 **17 Claims**



1. An apparatus for adsorbing an immunoglobulin in a body fluid comprising

a vessel having an inlet and an outlet for passing body fluid therethrough,

an adsorbent for an immunogloblin charged in said vessel, said adsorbent comprising a hydroxyl-containing water-insoluble carrier to which a diamine compound having the general formula:

$$NH_2(CH_2)_nNH_2$$

wherein n is an integer having a value of 3 to 9 is attached through a silane coupling agent or a derivative thereof, a heterocyclic compound being attached to the amine through a difunctional reagent, and

means for preventing the adsorbent from flowing out of said vessel.

4,705,629

MODULAR OPERATIONS CENTER FOR IN-GROUND SWIMMING POOL

Donald H. Weir, York, Pa.; Stanley H. Frederick, Sanford, N.C.; Robert A. Hotaling, York, Pa., and Ronald B. Robol, Sanford, N.C., assignors to Wexco Incorporated, York, Pa.

Division of Ser. No. 826,637, Feb. 6, 1986, Pat. No. 4,661,247. This application Feb. 4, 1987, Ser. No. 10,663

Int. Cl.[4] B01D *29/00*

U.S. Cl. 210—340 **3 Claims**

3. A dual filter unit for a swimming pool, said unit comprising: means for firstly, filtering water skimmed from the swimming pool water surface and means for, secondly, simultaneously filtering water drawn from a swimming pool main drain and including in combination, a first filter through which water skimmed from the pool is drawn and a second filter through which water from the swimming pool main is drawn, interconnecting valve means between said first and second filters for transferring water, flowing into said first and second filters, from one filter to the other of said filters when flow of

water to one of said filters is obstructed and means to draw water through each of said first and second filters.

4,705,630

CENTRIFUGATION

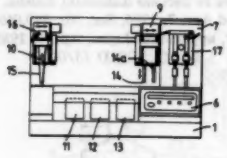
Alan J. Gordon, Liverpool; Donald G. Billington, Stoke on Trent; Robert Evans, Liverpool, and David J. Bowman, Manchester, all of England, assignors to Shandon Southern Products Limited, Runcorn, England

Filed Jun. 6, 1986, Ser. No. 871,530

Claims priority, application United Kingdom, Jun. 10, 1985, 8514591

Int. Cl.[4] B01D *33/22*

U.S. Cl. 210—361 9 Claims



1. Centrifugation apparatus comprising a carrier for mounting on a centrifugation head for rotation about the axis thereof, and including both a bucket for accomodating a sample chamber and means for supporting a specimen container in proximity to such sample chamber to enable centrifugation of material in the specimen container and subsequent transfer of centrifuged material from the specimen container to the sample chamber for centrifugation therein.

4,705,631

THICKENER

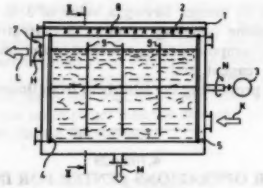
Jouko Hautala, and Esa Pikkujämsä, both of Tampere, Finland, assignors to Oy Tampella AB, Tampere, Finland

Filed May 19, 1986, Ser. No. 864,780

Claims priority, application Finland, Jun. 10, 1985, 852302

Int. Cl.[4] B01D *33/10*

U.S. Cl. 210—403 8 Claims



1. A thickener comprising:

a receptacle (1,21);

a thickening drum (2,22) mounted in the receptacle for rotation about an axis and having an axial filtering wall, including liquid draining devices in the axial surface thereof;

means for passing a liquid-and-solid-materials mass to be thickened into one axial end of the thickening drum (2,22), for the solid materials contained in the mass being thickened to form a filtering layer (6,26) on the inner surface of the filtering wall of the thickening drum (2,22) for filtering therethrough, as a filtrate, liquid from the mass into the receptacle (1,21);

means for controlling the flow of the mass through the drum including, at least one barrier plate (9,29) for radially dividing the inner space of the thickening drum into axially sequential spaces fixed within the thickening drum (2,22) for rotation therewith, the barrier plate having at least one opening axially therethrough for flow of the mass being thickened and at least one opening axially therethrough for air flow in the axial direction of the thickening drum (2,22), for preventing mixing of the mass axially of the thickening drum, the consistency of the mass continually thickening axially of the thickening drum; and

means for discharging the mass from the other axial end of the thickening drum (2,22).

4,705,632

HOLLOW FIBER MEMBRANE FORMED FROM A BLOCK COPOLYMER OF AROMATIC POLYESTER AND POLYOXYETHYLENE FOR DIALYSIS OF BLOOD

Koji Yagita, and Yotsuo Ono, both of Oita, Japan, assignors to Asahi Medical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 660,036, Oct. 12, 1984, abandoned. This application Mar. 28, 1986, Ser. No. 843,819

Int. Cl.[4] B01D *13/01*

U.S. Cl. 210—500.23 6 Claims

1. A hollow fiber membrane for dialysis of blood, which is formed by a process consisting of the step of melt-spinning a block copolymer having a reduced viscosity of 1.5 to 4.0, said block copolymer consisting of 30 to 60% by weight of an aromatic polyester having a water absorption up to 1% by weight and 40 to 70% by weight of a polyoxyethylene compound having a number average molecular weight of 3000 to 20000, said polyoxyethylene compound being selected from the group consisting of polyoxyethylene glycol, polyoxyethylene diamine, polyoxyethylene dicarboxylic acid and derivatives of said polyoxyethylene compound in which parts of the ethylene chains are substituted by propylene or tetramethylene.

4,705,633

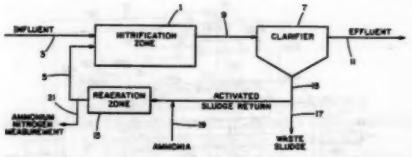
NITRIFICATION WITH SLUDGE REAERATION AND AMMONIA ENRICHMENT

Eugene D. Bogusch, 1421 Bolson Dr., Downers Grove, Ill. 60516

Filed Oct. 2, 1986, Ser. No. 914,616

Int. Cl.[4] C02F *3/12*

U.S. Cl. 210—614 8 Claims



1. In an activated sludge process for the nitrification of wastewater including a nitrification zone through which the wastewater is continuously passed while being aerated in the presence of activated sludge, a clarifier in which the nitrified wastewater from the nitrification zone is clarified, and a reaeration zone in which separated activated sludge from the clarifier is aerated at a pH of about 6 to 9 before being recycled back into the nitrification zone, the improvement for controlled enrichment of the reaeration zone with ammonium nitrogen, comprising:

(a) a step of measuring the ammonium nitrogen concentration in the activated sludge at an outlet of the reaeration zone feeding into the nitrification zone, and

(b) a step of adding an ammonium nitrogen enriching agent consisting essentially of anhydrous ammonia to an inlet of the reaeration zone at a controlled rate restricted by the ammonium nitrogen measurement whereby the ammonium nitrogen concentration found at an outlet of the reaeration zone feeding into the nitrification zone is maintained below a predetermined level of about 2 mg/l so as

not to adversely affect the nitrification efficiency of the nitrification zone.

4,705,634

PROCESS AND APPARATUS FOR THE BIOLOGICAL PURIFICATION OF WASTEWATER

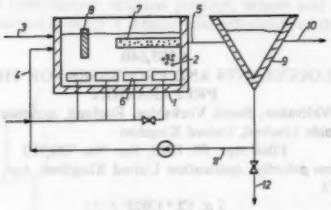
Hans Reimann, Munich, and Alfred Wildmoser, Haar, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Feb. 26, 1986, Ser. No. 832,782

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1985, 3506687

Int. Cl.[4] C02F *3/08*

U.S. Cl. 210—616 **24 Claims**



1. In a process for the biological purification of a wastewater wherein said wastewater is mixed with acitivated sludge in an aeration basin having inlet and output ends and containing carrier particles for microorganisms, and is aerated with an oxygen-containing gas in a flowpath from the inlet to the outlet ends, and wherein treated wstewater and free activated sludge are discharged from the outlet end of said aeration basin while retaining said carrier particles in the aeration basin, the improvement which comprises:

feeding wastewater and sludge to the inlet end of the aeration basin, treating said wastewater in an initial zone of said flowpath and withdrawing resultant treated wastewater and free activated sludge along the length of a zone downstream of said initial zone, said downstream zone extending lengthwise from within the basin to the outlet end of the basin, said downstream zone having a downsream terminus at said outlet end and an upstream terminus sufficiently distant from the downstream terminus so as to form a lengthwise extended discharge zone of sufficient size to reduce clogging of the outlet end of the aeration basin, said initial zone comprising 30% to 80% of the entire flowpath and said discharge zone comprising 20% to 70% of the entire flowpath.

4,705,635

PROCESS FOR ENRICHING AND SEPARATING OXIDES OF HEAVY HYDROGEN ISOTOPES FROM ACID, AQUEOUS SOLUTIONS OR OTHER AQUEOUS STREAMS

Arndt Knöchel; Burghard Döscher, both of Hamburg, and Wolfgang Podestà, Leverkusen, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Fed. Rep. of Germany

Filed Mar. 10, 1986, Ser. No. 837,918

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1985, 3508503

Int. Cl.[4] B01D *11/04*

U.S. Cl. 210—633 **13 Claims**

1. Process for enriching and separating oxides of heavy hydrogen isotopes from an acid, aqueous solution or another aqueous stream in which macrocyclic aminopolyether (APE) and an organic cation exchange agent are used, and in which there is a multistage repetition of single stages of (i) the enriching of the heavy hydrogen isotopes on the APE and (ii) a release of the heavy hydrogen isotopes in the form of their oxides, comprising:

(a) mixing the solution of the aqueous stream with at least one organic solvent which is miscible with water to form a liquid mixture,

(b) charging an organic, acid cation exchange agent in the H^+ form with a protonized or diprotonized APE to form a first solid phase,

(c) bringing the liquid mixture from step (a) into contact with the first solid phase from step (b) to effect an isotope exchange in which the heavy hydrogen isotopes are enriched on the first solid phase and depleted from the resulting liquid phase, thereby forming an enriched solid phase and a depleted liquid phase,

(d) adjusting the temperature of the first solid phase to a low temperature so that the isotope exchange of step (c) in which there is an enrichment of the heavy hydrogen isotopes on the first solid phase takes place at the low temperature, which is above the freezing or disintegration temperature of the liquid phase, and

(e) raising the temperature of the enriched solid phase to a temperature which is higher than in step (d) by a difference of between 30° K. and 150° K., and bringing a liquid mixture containing the solvent and the solution or the another aqueous stream, containing the heavy hydrogen oxides in a similar concentration as in the liquid mixture in step (c), into contact with the enriched solid phase at the higher temperature to bring about enrichment of the heavy hydrogen isotopes in the resulting liquid to thereby form an enriched liquid phase.

4,705,636

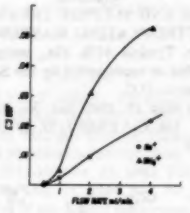
METHOD OF MAKING A COATING AND A PERMSELECTIVE MEMBRANE, IONIC POLYMER THEREFOR, AND PRODUCTS THEREOF

Hamish Small, Leland, and Inder Mani, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 19, 1985, Ser. No. 756,894

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—638 **61 Claims**



61. A method for separating ammonia from salt, alcohol from brine or iodine from salt comprising passing a fluid containing such materials through a perselective membrane having a charged, ultra-thin coating of a polymer of aromatic monomer, acrylate and aromatic vinyl chloride quaternized with a tertiary amine containing alkyl groups having C_1 to C_{20} carbon atoms, in which at least one alkyl group has at least two carbon atoms on an oppositely charged, permeable substrate forming the perselective membrane.

4,705,637

PROCESS FOR REDUCING THE WASH WATER REQUIREMENT OF WEAKLY BASIC ANION EXCHANGERS

Harold Heller, Cologne; Peter M. Lange, Leverkusen, and Friedrich Martinola, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 31, 1985, Ser. No. 740,089

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1984, 3422242

Int. Cl.[4] B01J *49/00*; C02F *1/42*

U.S. Cl. 210—670 **5 Claims**

1. In a process which comprises completely loading a weakly basic anion exchanger containing primary and/or secondary amino groups with water containing carbon dioxide to thereby produce an exhausted weakly basic anion exchanger, regenerating the anion exchanger, washing the anion exchanger with water, and repeating the loading step, the improvement which comprises treating the exhausted weakly basic anion exchanger with a dilute aqueous mineral acid before it is regenerated, at least 0.25 equivalents of the mineral acid being used per equivalent of effective capacity of the weakly basic anion exchanger, whereby the amount of wash water required to remove regenerant is reduced.

4,705,638

WASTE WATER TREATMENT

Jerzy J. Ganczarczyk, Islington, Canada, assignor to The University of Toronto Innovations Foundation, Canada

Continuation of Ser. No. 606,655, May 3, 1984, abandoned. This application Feb. 27, 1986, Ser. No. 833,586

Int. Cl.[4] C02F *1/52*

U.S. Cl. 210—710 **12 Claims**

1. A method of treating waste water containing a contaminant including a heavy metal cation consisting essentially of

mixing said waste water with an effective amount of desulfurization slag to cause deposition of said contaminant, said desulfurization slag including from about 45–45 weight % iron in the form of iron oxides, from about 1.5–1.6 weight % sulfur in combined form and from about 10 to about 15 weight % of calcium in the form of calcium oxide and calcium sulfides besed on the table weight of said desulfurization slag,

causing deposition of said contaminant from the mixture, and separating the deposit from the supernatant liquid.

4,705,639

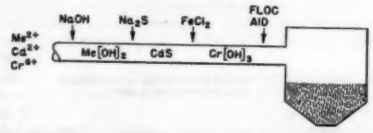
FERROUS AND SULFIDE TREATMENT OF ELECTROPLATING WASTEWATER

James R. Aldrich, Tyndall AFB, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 10, 1985, Ser. No. 733,294

Int. Cl.[4] C02F *1/52, 1/70*

U.S. Cl. 210—720 **2 Claims**



1. A method for minimizing sludge when removing hexavalent chromium from wastewater, said method comprising the steps of:

a. determining the concentration of hexavalent chromium in said wastewater, and adjusting the pH of said wastewater to about 8 to 10 with sodium hydroxide;

b. adding about 90 percent, stoichiometrically based on said concentration, of a first reducing chemical as a soluble sulfide,

c. adding about 10 to 20 percent, stoichiometrically based on said concentration, of a second reducing chemical as a soluble ferrous ion;

d. reducing said hexavalent chromium to chromium (III);

e. precipitating said ferrous ion as a sulfide after said reducing of chromium;

f. oxidizing said soluble sulfide to sulfate and having said sulfate remain substantially in said wastewater;

g. adding clarifying and flocculating agents to said wastewater to produce a sludge containing said chromium (III); and

h. removing said sludge from said wastewater wherein the volume of said sludge is about 2 parts to one part chromium.

4,705,640

FLOCCULANTS AND PROCESSES FOR THEIR PREPARATION

Tony Whittaker, South Yorkshire, England, assignor to Allied Colloids Limited, United Kingdom

Filed Apr. 30, 1985, Ser. No. 728,782

Claims priority, application United Kingdom, Apr. 30, 1984, 8410971

Int. Cl.[4] C02F *1/56*

U.S. Cl. 210—733 **12 Claims**

1. A process for flocculating an aqueous suspension of particulate material comprising forming a flocculant solution of a water soluble substantially linear organic polymeric flocculant having intrinsic viscosity (IV) greater than 4 dl/g and a molecular weight about 1 million by blending a water soluble substantially linear organic polymeric flocculant having IV greater than 5 dl/g with water to form an initial solution having a polymer concentration below 3% by weight, in which the polymeric flocculant is a soluble polymer formed from one or more ethylenically unsaturated monomers selected from the group consisting of acrylamide, methacrylamide, N-vinyl methyl acetamide, N-vinyl methyl formamide, vinyl acetate, vinyl pyrollidone, water soluble forms of carboxylic or sulphonic acids selected from acrylic acid, methacrylic acid, itaconic acid, and 2-acrylamido methyl propane sulphonic acid, sulpho propyl acrylate, sulpho propyl methacrylate, sulpho methylated acrylamide, dialkylaminoalkyl acrylates and methacrylates and their quaternary or acid salts, and dialkylaminoalkyl acrylamides and methacrylamides and their quaternary or acid salts, then improving the flocculation performance of the polymer by subjecting the dissolved polymer to degradation while dissolved in the solution for a period sufficient to improve said flocculation performance, flocculating said particulate material by addition of an effective amount of the flocculant solution to said aqueous suspension and separating the flocculated particulate material from the suspension.

4,705,641

COPPER MOLYBDENUM SALTS AS ANTIOXIDANTS

Irwin L. Goldblatt, Edison, N.J., and Leah T. Mendelson, Santa Ana, Calif., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Sep. 15, 1986, Ser. No. 906,934

Int. Cl.[4] C10M *129/26*

U.S. Cl. 252—35 **11 Claims**

1. A lube oil having improved oxidation stability comprising:

A. a basestock; and

B. a copper salt and a molybdenum salt wherein the total concentration of the copper and molybdenum metal or metal ions in solution ranges between about 0.006 and about 0.5 weight percent of the basestock.

4,705,642

HAZE, OXIDATION, AND CORROSION RESISTANT DIESEL ENGINE LUBRICANT

Rodney L. Sung, Fishkill; Benjamin H. Zoleski, Beacon, and Ronald L. O'Rourke, Hyde Park, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

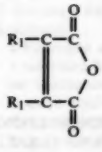
Continuation-in-part of Ser. No. 871,990, Jun. 9, 1986, abandoned. This application Dec. 23, 1986, Ser. No. 945,599

Int. Cl.[4] C10M *133/16, 135/36*

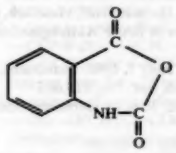
U.S. Cl. 252—47.5 26 Claims

1. A lubricating oil composition suitable for use in a diesel engine, comprising a major proportion of a hydrocarbon lubricating oil and from about 0.1 to 5.0 weight percent of a reaction product prepared by:

(a) first reacting at a temperature ranging from 50° to 150° C. substantially equimolar amounts of an anhydride compound and a hydrocarbon-substituted mono primary amine to produce an intermediate reaction product, where said anhydride reactant is either a dibasic acid anhydride of the formula



where R_1 is H, CH_3, or C_2H_5, or isatoic anhydride of the formula



and said mono primary amine reactant is either:

(i) a hydrocarbyl mono primary amine of the formula

$$R—NH_2$$

in which R is a monovalent straight-chained or branched-chained hydrocarbyl radical having from about 6 to about 22 carbon atoms or a hydrocarbyl aminoalkylene radical in which the hydrocarbyl group has from about 6 to about 22 carbon atoms and in which the divalent alkylene group has from about 2 to 3 carbon atoms; or

(ii) a hydrocarbon-substituted mono primary ether amine of the formula

$$R—[O(CH_2)_n]_x—[OCh_2—\underset{\displaystyle CH_3}{\underset{|}{CH}}]_y—NH_2$$

in which R is as previously described, x is an integer with a value of 0 or 1, y has a value from 0 to 10, and n is an integer from 1 to 5; and

(b) thereafter further reacting at an elevated temperature said intermediate reaction product with a substantially equimolar amount of a nitrogen-containing compound which may be either:

(i) a heterocyclic azole compound selected from the group consisting of tolyltriazole, benzotriazole, aminotriazole, aminotetrazole, aminomercaptothiadiazole, and benzomercaptothiazole; or

(ii) a polyalkylene polyamine compound of the formula

$$NH_2—(CH_2—CH_2—NH)_z—H$$

in which z is an integer from 1 to 5.

4,705,643

DETERGENT LUBRICANT COMPOSITIONS

Thomas E. Nemo, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 30, 1984, Ser. No. 646,131

Int. Cl.[4] C16M *129/00*

U.S. Cl. 252—51.5 A 6 Claims

1. A lubricating oil composition comprising a lubricating oil and a detergent additive wherein said detergent additive is the hydrolyzed reaction product of an aliphatic branched chain carboxylic acid of 16 to 20 carbon atoms and a polyamine of at least 3 amine groups wherein said carboxylic acid and said polyamine are reacted at a temperature of from about 100° C. to about 250° C. to form a reaction product, said reaction product is cooled and hydrolyzed by addition of water at a temperature of up to 100° C. where said hydrolyzed reaction product is essentially free of imidazoline units.

4,705,644

ALPHA-SULFO-HIGHER FATTY ACID-LOWER ALCOHOL ESTER- AND AMIDE-BASED DETERGENT LAUNDRY BARS AND PROCESS FOR MANUFACTURE THEREOF

Patrizia Barone, Piscataway, and Pallassana N. Ramachandran, Robbinsville, both of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Filed Mar. 6, 1986, Ser. No. 836,909

Int. Cl.[4] C11D *17/00*

U.S. Cl. 252—135 15 Claims

1. A detergent laundry bar of good mildness, foaming properties for hand washing of laundry, and processing characteristics, consisting essentially of 10 to 30% of water soluble salt selected from the group consisting of alpha-sulfo-higher fatty acid-lower alcohol ester, alpha-sulfo-higher fatty acid amide, and mixtures thereof, 10 to 50% of builder for the detergent, a bodying proportion, in the range of 20 to 70%, of material selected from the group consisting of water insoluble powder, sodium sulfate filler, and mixtures thereof, and 5 to 20% of water, which water includes water removable from any hydrate components of the detergent laundry bar when such bar is subjected to heating at 105° C. for two hours.

4,705,645

METHOD FOR PREPARING AN ELECTRICALLY CONDUCTIVE POLYMER BLEND

Kang I. Lee, St. Louis, Mo., and Harriet Jopson, Dover, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Division of Ser. No. 554,610, Nov. 23, 1983, Pat. No. 4,510,075. This application Dec. 21, 1984, Ser. No. 684,493

The portion of the term of this patent subsequent to Oct. 7, 2003, has been disclaimed.

Int. Cl.[4] H01B *1/20*

U.S. Cl. 252—500 13 Claims

1. A method of preparing an electrically conductive polymer blend comprising:

a. forming an acetylene polymer within a matrix of an elastomer having a low level of unsaturation, said elastomer comprising a copolymer of a monoethylenically unsaturated monomer with a diene; and

b. doping said acetylene polymer with an electron donor or an electron acceptor to a level sufficient to provide said blend with an electrical conductivity of at least about 10^{-6} ohm^{-1} cm^{-1}.

4,705,646

CONDUCTIVE COATING

Preston S. DuPont, Northridge; Robert E. Ritter, Palos Verdes, and John P. Stafford, Culver City, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 639,984, Aug. 13, 1984, which is a division of Ser. No. 381,125, May 24, 1982, Pat. No. 4,534,998. This application Dec. 10, 1984, Ser. No. 679,978

Int. Cl.[4] H01B *1/24*

U.S. Cl. 252—511 7 Claims

1. A dispersion for spraying onto a surface to act as an electrically conductive coating for the surface comprising:

a first mixture consisting essentially of 0.03 parts by weight of carbon black together with a coupling agent and substantially twenty parts by weight of solvent mixed together and dispersed by high shear mixing to provide thorough wetting of the carbon black, mixed by low shear mixing into a second mixture consisting essentially of a thermally crosslinking two-part polymer resin to provide carbon black particles incompletely coated with said second mixture which dries and cures to a coating having a resistance of substantially 6×10^5 ohms per square.

4,705,647

COPPER-TYPE CONDUCTIVE COATING COMPOSITION

Shoji Yamaguchi, Yokkaichi, and Kimiko Yamada, Nagoya, both of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 749,463, Jun. 27, 1985, Pat. No. 4,663,079. This application Jun. 26, 1986, Ser. No. 878,578

Claims priority, application Japan, Jul. 31, 1984, 59-160893; Sep. 25, 1984, 59-199738

Int. Cl.[4] H01B *1/06*

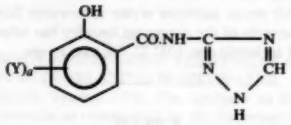
U.S. Cl. 252—512 7 Claims

1. A copper-containing conductive coating composition which comprises:

(A) a copper powder with hydrogen loss of at most 0.2% by weight or a copper powder with its oxidized surface layer removed by treatment with an organic carboxylic acid in an amount of 10 to 90% by weight,

(B) a coating binder resin in an amount of 10 to 90% by weight, and

(C) an antioxidant selected from triazoles represented by the formula:



wherein Y is a hydroxyl group, a hydrogen atom, a C_1–C_{18} alkyl group or a halogen atom, and a is an integer of 1 to 3, in an amount of 0.01 to 5% by weight effective to prevent oxidation of the copper powder.

4,705,648

THERMALLY CONDUCTING, ELECTRICALLY INSULATING THERMOPLASTICS

Karl-Heinz Reichert, Berlin; Wolfgang Schoeppel, Norderstedt; Stawros Ewangelidis, Berlin; Jürgen Bednarz, Penzberg, and Ulrich Leute, Zorneding, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 5, 1985, Ser. No. 741,351

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1984, 3421105

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—512 17 Claims

1. An electrically insulating, thermally conductive polyolefin resin composition containing from about 25 to 85 volume percent of light metal particles dispersed therethrough on a 100 volume percent total resin composition basis, said polyolefin resin having been produced by polymerizing a composition comprising

(a) at least one compatible lower alkene monomer selected from the group ethylene, propylene, and butene,

(b) an alkadiene as a crosslinking monomer having from about 6 to 14 carbon atoms,

(c) a Ziegler-Natta catalyst, and

(d) light metal particles comprising a metal selected from the group aluminum, magnesium, beryllium, and alloys thereof with said particles having oxidized surfaces and being dispersed in the liquid phase of said monomer composition, said light metal of said particles being characterized by having a specific gravity of less than about 3, said particles being characterized by having a particle size in the range from about 1 to 100 microns said particles comprising from about 25 to 85 volume percent of said resin composition.

4,705,649

PREPARATION OF ACYLOXYBENZENESULFONIC ACIDS AND THEIR ALKALI METAL AND ALKALINE EARTH METAL SALTS

Wolf-Dieter Balzer, Ludwigshafen; Hans-Heinrich Bechtolsheimer, Dittelsheim-Hessloch; Karl-Heinz Beyer, Frankenthal; Rolf Fikentscher, Ludwigshafen; Johannes Perner, Neustadt; Rudi Widder, Leimen, and Helmut Wolf, Hassloch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

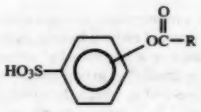
Continuation of Ser. No. 731,400, May 7, 1985, abandoned. This application Nov. 7, 1986, Ser. No. 928,696

Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419793

Int. Cl.[4] C07C *69/76, 69/00*

U.S. Cl. 260—402 10 Claims

1. A process for the preparation of an acyloxybenzenesulfonic acid or its alkali metal or alkaline earth metal salts of formula (I):



where R is a straight-chained or branched, saturated alkyl radical of 5–11 carbon atoms, or R is phenyl, said process comprising:

(i) sulfonating phenol with SO_3 or chlorosulfonic acid, wherein the sulfonation is carried out in the presence of from 0.2 to 20 mole %, based on the SO_3 or the chlorosulfonic acid, of a complexing agent for SO_3 or chlorosulfonic acid, at a temperature of from 20°–80° C.;

(ii) esterifying the resulting phenol sulfonic acid by directly reacting the phenol sulfonic acid with an acyl chloride of the formula Cl-COR at a temperature of from 25°–55° C.; and

(iii) neutralizing the acyloxybenzenesulfonic acid obtained by combining the liquid acyloxybenzenesulfonic acid obtained with an aqueous solution of an alkali metal or alkaline earth metal hydroxide, carbonate or bicarbonate in water at a temperature of from 0°–60° C., with thorough mixing, and maintenance of the pH to a value from 3.0 to 5.5.

4,705,650

PROCESS FOR THE PREPARATION OF COMPOUNDS HALOGENATED α TO AN ELECTRON-ATTRACTING GROUP

Gerard Mignani, Lyons, and Didier Morel, Villiers sur Orge, both of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Filed Jul. 10, 1985, Ser. No. 753,532
Claims priority, application France, Jul. 12, 1984, 84 11087
Int. Cl.[4] C07C *147/06*
U.S. Cl. 260—405.5 **7 Claims**

1. A process for the preparation of a compound halogenated in an α-position to an electron-attracting group and of the formula:

in which

X denotes a halogen atom;

R denotes

a hydrogen atom, or

a saturated hydrocarbon radical, or

an unsaturated hydrocarbon radical containing one or more double or triple bonds,

these radicals being unsubstituted or substituted by one or more radicals, which are identical or different, chosen from

phenyl,

alkoxy-carbonyl,

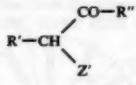
acyl, and

cyano radicals; and

Z denotes a radical —CHO, —COR_2, —$COOR_3$, —$CONR_4R_5$, —CN, —SO_2R_6, —NO_2, —CO—$(CH_2)_p$—$COOR_1$ or —CO—$O(CH_2)_p$—$COOR_1$, p being an integer from 2 to 10 inclusive,

the radical Z not denoting —$CO(CH_2)_p$—$COOR_1$ or —CO—$O(CH_2)_p$—$COOR_1$ when R is a said saturated hydrocarbon radical substituted by alkoxycarbonyl and of formula —$(CH_2)_n$—$COOR_1$ in which n is an integer from 3 to 10;

which process comprises simultaneously halogenating and deacylating a compound of the formula:



in which

R′ denotes

a hydrogen atom or

a saturated hydrocarbon radical or

an unsaturated hydrocarbon radical containing one or more double or triple bonds,

these radicals being unsubstituted or substituted by one or more radicals, which are identical or different, chosen from

phenyl,

alkoxycarbonyl,

acyl, and

cyano radicals; and

(a) R″ denotes a methyl radical; and Z′ denotes a radical —CHO, COR_2, —$COOR_3$, —$CONR_4R_5$, —CN, —SO_2R_6 or NO_2; or

(b) R′ and R″ together form a radical —$(CH_2)_n$— in which n is as hereinbefore defined and Z′ is as hereinbefore defined; or

(c) R′ is as hereinbefore defined and R″ and Z′ together form a radical —CO—$(CH_2)_p$— or —$COO(CH_2)_p$— in which p is as hereinbefore defined and the carbonyl group is attached in the position of Z′; the aforesaid saturated hydrocarbon radicals containing 1 to 20 carbon atoms each, the said unsaturated hydrocarbon radicals containing 2 to 20 carbon atoms each, and the radicals R_1, R_2, R_3, R_4, R_5 and R_6 each denote alkyl radicals containing 1 to 4 carbon atoms each and the alkyl moieties of the alkoxy-carbonyl radicals contain 1 to 4 carbon atoms each;

by treatment with an alkali metal alcoholate or an alkali or alkaline-earth metal carbonate in an organic solvent and with a halogenating agent at a temperature of from −30° to 100° C.

4,705,651

PROCESS FOR THE PREPARATION OF DIPHOSPHONIC ACIDS

Giorgio Staibano, Coltano, Italy, assignor to Istituto Gentili S.p.A., Pisa, Italy

Filed Oct. 11, 1985, Ser. No. 786,815
Claims priority, application Italy, Oct. 29, 1984, 23362 A/84
Int. Cl.[4] C07F *9/38*
U.S. Cl. 260—502.5 C **1 Claim**

1. In the process of preparation of a compound I which is 4-amino-1-hydroxybutane-1,1-diphosphonic acid or 6-amino-1-hydroxyhexane-1,1-diphosphonic acid wherein a compound II which is 4-aminobutyric acid or 6-aminocaproic acid respectively is reacted with compound III which is orthophosphorous acid and with compound IV which is phosphorus trichloride and the product is hydrolyzed, the improvement which consists of melting orthophosphorous acid, adding said compound II in the ratio of 1:1.25 mole of compound II to compound III, in the absence of a solvent; then adding 2 moles of phosphorous trichloride, maintaining the mixture under reflux until the mixture hardens, heating three hours, then adding water, refluxing 4–12 hours to obtain a reaction mixture, pouring said reaction mixture into an alcohol of 1–3 carbon atoms and isolating said product I from the reaction mixture.

4,705,652

TETRA-ALKALI METAL SALTS OF CHROMOTROPIC ACID, A PROCESS FOR THEIR ISOLATION AND THEIR USE

Erich Hammerschmidt, Bergisch Gladbach; Horst Behre; Heinz U. Blank, both of Odenthal, and Dietmar Mayer, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 797,586, Nov. 13, 1985, abandoned, which is a continuation of Ser. No. 627,944, Jul. 5, 1984, abandoned. This application May 23, 1986, Ser. No. 867,111
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1983, 3327275
Int. Cl.[4] C07C *143/30*
U.S. Cl. 260—512 C **6 Claims**

1. In a process for the production of chromotropic acid in which process 1-amino-naphthalene-3,6,8-trisulfonic acid is converted into chromotropic acid by alkaline pressure hydrolysis with aqueous sodium hydroxide solution and the chromotropic acid is isolated as the disodium salt, the improvement comprising

(a) isolation of the chromotropic acid as the tetrasodium salt by concentrating the alkaline hydrolysis solution of chromotropic acid or by saturation of the said solution with sodium ion and cooling the solution to a temperature below 70° C. and

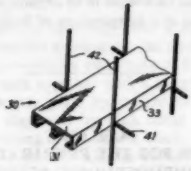
(b) converting the tetrasodium salt into the disodium salt by acidification.

4,705,653

SPLASH BAR FOR COOLING TOWER FILL ASSEMBLY

David W. Stackhouse, and Stephen C. Heidl, both of Sebastopol, Calif., assignors to Research-Cottrell, Inc., Bedminster, N.J.

Filed Oct. 28, 1985, Ser. No. 792,034
Int. Cl.[4] B01D *47/00*
U.S. Cl. 261—111 13 Claims



1. A crossflow cooling tower fill assembly for allowing liquid to fall down through said fill assembly and for allowing cooling air to flow through the fill assembly transverse to the flow of said liquid in order to cool said liquid, said assembly comprising:

a plurality of longitudinal splash bars; and

means for supporting said splash bars so that said splash bars are substantially horizontal and parallel to one another and arranged in a plurality of vertically spaced, substantially horizontal planes, the splash bars in each plane being horizontally spaced from one another to allow said liquid to fall down between said splash bars to the planes of splash bars below, each splash bar including a substantially horizontal, longitudinally extending top web member having (1) longitudinally extending, downwardly projecting vertical side web members, both of said side web members having a lower longitudinal edge with a longitudinally extending, inwardly projecting flange, and (2) at least one longitudinally extending, downwardly projecting rib web member between said side web members, each said rib web member having a lower longitudinal edge with a longitudinally extending, laterally projecting flange.

4,705,654

METHOD OF HUMIDIFYING A GAS

Kensuke Niwa; Hisayoshi Fujita, both of Tokyo; Yoshihiko Saito, Niigata; Hiroshi Makihara, Hiroshima; Ritsuo Hashimoto, Hiroshima; Younosuke Hoshi, Hiroshima, and Katsutoshi Murayama, Niigata, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Mitsubishi Gas Chem. Company, Inc., both of Tokyo, Japan

Continuation of Ser. No. 670,610, Nov. 13, 1984, abandoned. This application May 15, 1986, Ser. No. 863,519
Claims priority, application Japan, Nov. 14, 1983, 58-212512; Nov. 14, 1983, 58-212513
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—128 6 Claims

1. A method of humidifying a gas comprising:

flowing a liquid composed mainly of water over one surface of a heat conducting wall to form a wetted wall;

flowing a gas to be humidified over said one surface in contact with said wetted wall;

flowing a heating medium over the other surface of said wall for heating the wall to evaporate said liquid and humidify said gas; and

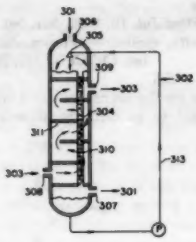
recirculating said liquid which is not evaporated to said liquid flowing over said one surface for providing a greater amount of said liquid flowing over said one surface than the amount of liquid evaporated so that the amount of liquid supplied for flowing over said one surface prevents dry patches from forming on said one surface and satisfies the following equation:

$$q < 5.99 \times 10^5 \Gamma^{2.12} \quad (1)$$

where;

q is the heat flux in W/m^2K.

where,



W = watts

K. = temperature in degrees Kelvin and

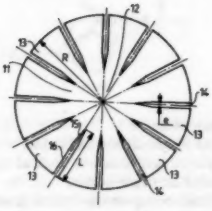
Γ = amount of flowing liquid with regard to the mass of liquid per unit wet width in kg/ms.

4,705,655

PROCESS FOR THE MANUFACTURE OF COMBUSTIBLE ARTICLES BY EMBOSSING COMBUSTIBLE PAPER AND COMBUSTIBLE ARTICLES THUS PRODUCED

Michel Maures; Jacques Pasdeloup, and Patrick Lespinasse, all of Bergerac, France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Sep. 16, 1985, Ser. No. 776,430
Claims priority, application France, Sep. 24, 1984, 84 14587
Int. Cl.[4] C06B *21/00*; F42B *5/18*; D03D *23/00, 43/00*
U.S. Cl. 264—3.4 8 Claims



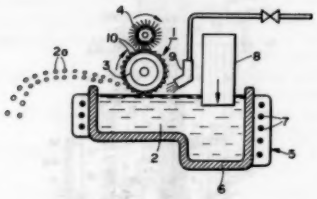
1. Process for the manufacture of combustible dish-shaped articles of revolution with circular external outlines, components for combustible cases such as lids, bottoms or combustible containers, which consists of embossing at least one disc from combustible paper containing nitrocellulose, said disc being made by the papermaking method from an aqueous suspension containing nitrocellulose, said disc comprising a central part and a peripheral part consisting of a plurality of portions separated from each other by radial slits, the length "L" of said slits being smaller than the radius "R" of said disc and the width "e" of said slit is at least equal to the minimum width required to prevent the overlapping of the said portions when the disc is deformed by embossing.

4,705,656

METHOD FOR PRODUCING SPHERICAL METAL PARTICLES

Takashi Onoyama, Yokohama, and Hiroshi Makino, Kawasaki, both of Japan, assignors to Nippon Yakin Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 698,558, Feb. 6, 1985, abandoned. This application Jul. 3, 1986, Ser. No. 882,078
Claims priority, application Japan, Feb. 10, 1984, 59-24180
Int. Cl.[4] B22F 9/10
U.S. Cl. 264—8 8 Claims



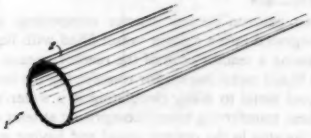
1. A method of producing spherical metal particles comprising the steps of: dipping teeth or serrations disposed around the outer periphery of a rotary drum into molten metal contained in a molten metal reservoir by lowering the drum until a tip end of the teeth contacts the molten metal, scattering the molten metal adhered to the teeth away from said teeth by centrifugal force acting on said rotary drum before even a part of said molten metal adhered to said teeth solidifies, cooling said molten metal to solidify during its flight by a surrounding atmosphere while letting each of the scattered molten metal droplets take the shape of a sphere or similar configuration due to its own surface tension.

4,705,657

METHOD OF MAKING AND APPLYING ETHYLENE-PROPYLENE DIENE TERPOLYMER TEXTURIZED HEAT SHRINKABLE TUBING

Benoit L. Poulin, Hudson, N.H., assignor to Essex Group, Inc., Ft. Wayne, Ind.

Division of Ser. No. 584,677, Feb. 29, 1984, abandoned. This application Apr. 30, 1984, Ser. No. 728,972
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.
Int. Cl.[4] B29C 61/08; B29B 13/08
U.S. Cl. 264—22 2 Claims



1. A method of making a heat shrinkable tubing consisting of:

melting ethylene-propylene diene terpolymer material,

extruding the melted terpolymer through a die to produce a tubular structure having substantially parallel, raised portions extending along the tube's exterior surface substantially perpendicular to the tube's circumference,

irradiating the extruded tube to partially cross-link the extruded terpolymer tube,

heating the tube above the terpolymer crystallization temperature,

imposing a positive pressure to the interior of the heated tube to impart radial shrinkage memory to the tubing while holding the heated tubing under linear tension to provide about 5 percent to about 30 percent longitudinal shrinkage memory to the tubing,

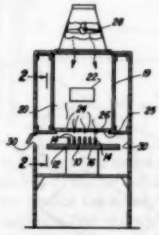
cooling the tubing in the expanded state, thereby resulting in a tubing which shrinks radially and longitudinally with a smooth crimp-free application to curved and bent substrates while retaining its textured pattern.

4,705,658

METHOD FOR DRYING GELATIN IN THE MANUFACTURE OF HARD SHELL GELATIN CAPSULES

Stephen Lukas, Harrow, Canada, assignor to Capsule Technology International, Ltd., Windsor, Canada

Filed Apr. 7, 1986, Ser. No. 849,057
Int. Cl.[4] B29C 71/04
U.S. Cl. 264—25 8 Claims



1. A method for drying gelatin on pins to form hard shell gelatin capsules comprising the steps of:

irradiating the gelatin in a drying chamber with microwave energy for a time period sufficient to dry the gelatin,

thereafter moving the pins to a substantially closed cooling chamber separate from the drying chamber so that the gelatin on the pins gradually cools to ambient temperature, and

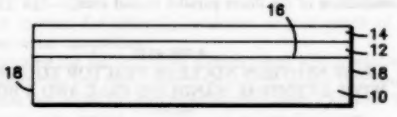
then stripping the solidified gelatin from the pins.

4,705,659

CARBON FILM OXIDATION FOR FREE-STANDING FILM FORMATION

Jonathan J. Bernstein, Tempe; T. Bruce Koger, Buckeye, and Charles S. Chanley, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 718,268, Apr. 1, 1985, abandoned. This application Jul. 7, 1986, Ser. No. 882,864
Int. Cl.[4] B29C 41/22
U.S. Cl. 264—29.6 17 Claims



12

1. A process for fabricating a free-standing sheet of silicon which comprises the steps of: providing a refractory substrate having a surface; forming a pyrolytic carbon layer overlying said surface by heating said surface and decomposing a hydrocarbon thereon; depositing a layer of silicon overlying said carbon layer; providing an edge at which said carbon layer is exposed; and separating said layer of silicon from said substrate by heating in an oxygen ambient to oxidize said carbon layer from beneath said layer of silicon.

11. A process for fabricating a free-standing sheet of refrac-

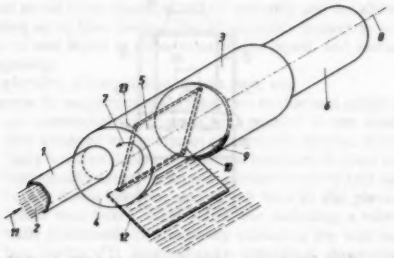
tory material which comprises the steps of: providing a substrate of a first refractory material; forming a layer of barrier material overlying said first refractory material; forming a pyrolytic carbon layer overlying said layer of barrier material; depositing a layer of a second refractory material overlying said pyrolytic carbon layer; providing an edge at which said carbon layer is exposed; and separating said layer of a second refractory material from the underlying layer by heating in an oxidizing ambient to oxidize said carbon layer.

4,705,660

METHOD AND APPARATUS FOR PRODUCING A PIPE OF FIBER-REINFORCED, HARDENABLE SYNTHETIC RESIN

Robert Demarle, 9373 St. Paul, Karnten, Austria

Filed Apr. 11, 1985, Ser. No. 723,493
Int. Cl.[4] B29C *41/04*
U.S. Cl. 264—108 **8 Claims**



1. In a method for the production of fiber-reinforced pipes of hardenable synthetic resin by a centrifugal molding method, wherein the fibers and the synthetic resin are fed to a horizontally rotatable mold in axially parallel direction thereto and the fibers are introduced into the interior of the rotating mold and are distributed about the side walls of the mold and along the longitudinal length of the mold; the improvement comprising imparting to the fibers within the mold an acceleration oriented transversely to their direction of movement during introduction into the mold while maintaining the orientation of the fibers parallel to the axis of the mold.

4. In an apparatus for producing fiber-reinforced pipes of a hardenable synthetic resin, comprising a rotatable pipe mold, and means to introduce into the interior of the mold fibers oriented parallel to the axis of rotation of the mold; the improvement comprising a vane disposed within the mold and rotatable about an axis parallel to the axis of rotation of the mold, the vane having a surface contacting the fibers to accelerate the fibers against an internal side wall of the mold, said surface being parallel to said axes thereby to maintain the orientation of the fibers parallel to said axes.

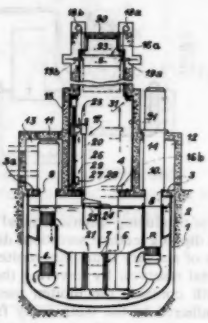
4,705,661

FAST NEUTRON NUCLEAR REACTOR EQUIPPED WITH A CENTRAL HANDLING CELL AND A BOXED SLAB

Jean-Pierre Cransac, Puyricard; Patrick Jogand, la Tour d'Aigues, and Michel Sauvage, Aix en Provence, all of France, assignors to Electricite de France Service National, Paris, France

Filed May 31, 1985, Ser. No. 739,683
Int. Cl.[4] G21C *13/00*
U.S. Cl. 376—206 **10 Claims**

1. A fast neutron reactor comprising: a liquid metal-filled vessel having an upper part, a reactor core, a reinforced concrete boxed slab sealing said upper part and having a lower plate with a central opening, a plug-cover-core located in said central opening and overhanging the reactor core and incorporating assemblies, said lower plate also having peripheral openings arranged in the form of a ring around the central opening, pumps and heat exchangers traversing said peripheral openings and having heads contained in recesses formed in the thickness of the slab, a central handling cell surmounting said central opening, at least one radial passage radially of, and linking said central cell with, a transfer cell adjacent thereto, for discharging assemblies placed between two adjacent recesses and issuing directly into said the central cell, said central cell and said radial passage being defined by reinforced concrete boxes constituting part of the boxed slab, and handling and discharge



means for conveying said assemblies between said reactor core and said transfer cell, while passing through said central cell and said radial passage, said handling and discharge means comprising a vertical beam mounted so as to be displaceable in said central cell around said central opening and in said radial passage on at least one rail, said beam being pivotable about an axis thereof and slidingly supporting a carriage on which a gripping arm is articulated about a vertical shaft, said handling and discharge means being collapsable against said box of said central cell by rotating said beam about said axis thereof and by rotating said gripping arm about said vertical shaft.

4,705,662

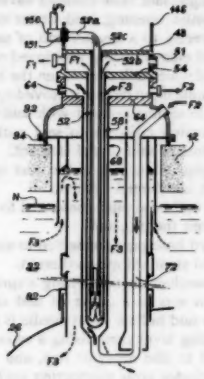
FAST NEUTRON NUCLEAR REACTOR WITH A STEAM GENERATOR INTEGRATED INTO THE VESSEL

Zéphyr Tilliette, Clamart, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed May 10, 1985, Ser. No. 732,742
Claims priority, application France, May 11, 1984, 84 07332
Int. Cl.[4] G21C *15/24*
U.S. Cl. 376—405 **12 Claims**

1. A fast neutron nuclear reactor comprising: a primary circuit integrated into a reactor vessel filled with liquid metal and containing a reactor core of the reactor, means for circulating the liquid metal, means for transferring the heat carried by the liquid metal to water circulating in a water/steam circuit, the heat transferring means comprising at least one steam generator located in the reactor vessel and having at least one group of inner tubes in which circulates the water of the water/steam circuit, at least one group of outer tubes immersed in the liquid metal of the primary circuit, the outer tubes respectively surrounding the inner tubes in order to define therewith an annular space under a pressurized neutral gas and connected to a secondary circuit with a low thermal power having means for circulating the pressurized neutral gas in said annular space and for ensuring heat exchange, said reactor vessel being sealed by a horizontal sealing slab tightly passing through the steam generator, the steam generator having above said slab an upper tube plate supporting the group of inner tubes, the inner tubes being open at inner ends thereof, an intermediate tube plate surmounted by a steam discharge chamber of the water/-

steam circuit and supporting a group of intermediate tubes surrounding the inner tubes and being closed at lower ends thereof and into the lower ends of which issue the inner tubes, and a lower tube plate surmounted by a neutral gas discharge and supporting the group of outer tubes, said outer tubes surrounding the intermediate tubes, the steam generator also



having neutral gas tubes connecting bottoms of the outer tubes to neutral gas inlet ports located between the lower tube plate and the sealing slab, said neutral gas tubes being provided below the bottoms of the outer tubes with a substantially horizontal portion serving to compensate for differential expansions.

4,705,663

NUCLEAR REACTOR FUEL ELEMENT

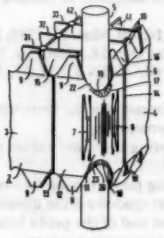
Josef Steven, Neunkirchen/Brand, and Karl Hassfurther, Bamberg, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim/Ruhr, Fed. Rep. of Germany

Filed Nov. 22, 1985, Ser. No. 801,140

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1984, 3443861

Int. Cl.[4] G21C *3/34*

U.S. Cl. 376—442 **3 Claims**



1. In a nuclear reactor fuel element for receiving mutually parallel rods, the improvement comprising a rectangular grid-shaped spacer including planar webs crossing and facing the rods defining grid mesh openings receiving the rods, said webs including two outer webs forming an outer corner of said spacer and defining a corner grid mesh opening at said outer corner, said outer corner having an outward curve being curved around a direction parallel to the longitudinal direction of the rods, said outer webs having edges at said curve transverse to the rods being drawn inward toward the rods in the corner grid mesh opening forming a bevel in longitudinal direction of the rod, and said edges of said outer webs forming edges of a channel on said curve.

4,705,664

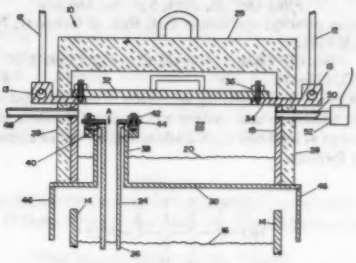
RADIANT HEAT VAPORIZING INJECTOR

Richard N. Haigh, Lancaster, Pa., assignor to Harbinger Labs, Inc., Denver, Colo.

Filed Oct. 29, 1986, Ser. No. 927,076

Int. Cl.[4] C21C *7/02*

U.S. Cl. 420—18 **14 Claims**



1. An apparatus for injecting a first material of lower melting point into a second material of higher melting point while the second material is in the molten state comprising:

a sealed vessel containing a first material of lower melting point the sealed vessel being located above a surface of a molten second material of higher melting point, at least one surface of the sealed vessel being exposed to heat from the surface of the molten second material;

a passageway attached to the sealed vessel, one end of the passageway being immersed in the molten second material and the other end of the passageway terminating in the sealed vessel at a location which is above the surface of the first material when it is in the liquid state; and

a loading means in the sealed vessel which permits loading the first material into the sealed vessel but prevents gas and vapor from leaving the sealed vessel through the loading means.

4,705,665

METHOD FOR INHIBITING OXIDATION OF FERROUS METALS WITH ALKYL GLYCOSIDES AND COMPOSITION FOR CLEANING FERROUS METALS

Arshad H. Malik, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation-in-part of Ser. No. 727,647, Apr. 26, 1985. This application Dec. 13, 1985, Ser. No. 808,585

Int. Cl.[4] C11D *7/08;* C23F *11/04;* C23G *1/06*

U.S. Cl. 422—12 **17 Claims**

1. A method for inhibiting oxidation or acid attack of a ferrous metal comprising:

contacting the surface of the ferrous metal with a solution which has less than about 2 percent by weight inorganic salts and which solution includes from about 1 to about 20 percent by weight of a glycoside having the formula

$$R(OG)_x$$

wherein

R is an aliphatic hydrocarbon radical having from 1 to 25 carbon atoms or is a radical with the formula $R_1(OR_2)_n$ which does not have more than 25 carbon atoms and wherein n=0 to 24 and R_1 and R_2 are aliphatic hydrocarbon radicals,

G is selected from the group consisting of fructose, glucose, mannose, galactose, talose, gulose, allose, altrose, idose,

arabinose, xylose, lyxose, ribose or mixtures thereof, and x is 1 to 30.

4,705,666

ALKANOLAMIN SALTS OF ALKENYL SUCCINIC ACID DIALKYL SEMIAMIDE CORROSION INHIBITORS

Alfred Struve, Hilden; Horst Upadek, Ratingen, and Juergen Geke, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

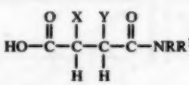
Filed Oct. 30, 1984, Ser. No. 666,408

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1983, 3341013

Int. Cl.[4] C23F *11/04;* **C07C** *83/00;* **C09K** *3/00*

U.S. Cl. 422—16 **6 Claims**

1. A method of inhibiting corrosion in aqueous system comprising adding to said system a corrosion inhibitive effective amount of at least one C_2–C_4-alkanolamine salt of a compound of the formula:



wherein: one of X or Y is H and the other is a C_{10-18}-alkenyl; and R and R^1 are each the same C_{3-8}-alkyl; said salt being present in an amount of about 0.1 to 15% by weight of the semiamide acid, based upon the weight of said aqueous system.

4,705,667

ANALYZING APPARATUS FOR MEASURING LIQUID OR GASEOUS SAMPLES

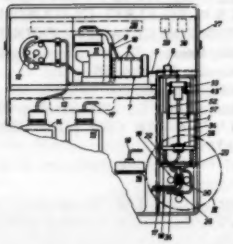
Hermann Marsoner, Steinberg, and Erich Kleinhappl, Kumberg, both of Austria, assignors to AVL AG, Schaffhausen, Switzerland

Filed Jan. 25, 1985, Ser. No. 695,066

Claims priority, application Austria, Feb. 2, 1984, 341/84

Int. Cl.[4] G01N *1/02, 1/14;* **B65B** *3/04, 3/14*

U.S. Cl. 422—68 **6 Claims**



1. An analyzing apparatus for analyzing liquid or gaseous samples which comprises

a sample input device including a movable hollow input needle which defines a central axis and has a point end in which an input opening is located, and a tilting mechanism to move said hollow input needle between a first position for obtaining a sample for analysis and a second position for introducing standard media or air into said hollow input needle,

a sample measuring cell for analyzing liquid or gaseous samples, said sample measuring cell having an input side and an output side, said sample input device being connected to the input side of said measuring cell,

a feed pump which is connected to the output side of said sample measuring cell for drawing liquid or gaseous samples from said hollow input needle to said sample measuring cell and discharging the same to a waste vessel,

a funnel element having a conical portion and a flow channel therethrough, said flow channel having an inlet opening and an outlet opening, said outlet opening being connected directly to a smaller end of said conical portion, said funnel element being positioned relative to said sample input device such that, when the hollow input needle of said sample input device is moved to its second position, it will be in sealing contact with said smaller end of said conical portion adjacent to said outlet opening of said flow channel of said funnel element,

a first hose pipe connected to the inlet opening of said flow channel in said funnel element,

a valved second hose pipe connected to said first hose pipe to supply air thereto, and

a valved third hose pipe connected to said first hose pipe to supply said standard media thereto,

said tilting mechanism comprising a spring-loaded actuator flap which acts as a cover of said sample input device whenever said hollow input needle is in said second position, a tilting lever comprising a swivel bracket which is connected to said actuator flap, and a lever mechanism which includes arms connecting said funnel element to said swivel bracket to guide said funnel element in the direction of the central axis of said hollow input needle, said arms acting to push said funnel element away from said point of said hollow input needle whenever said actuator flap is lifted from its initial position, said tilting lever being provided with a cross axle which, in said second position of said hollow input needle, is at a certain distance from said hollow input needle, such that said cross axle will be in contact with said hollow input needle once a given lifting angle of said actuator flap has been reached, and that, upon said actuator flap being lifted further, said cross axle will carry along with it said hollow input needle, which can be moved around a fixed shaft in said apparatus until said first position has been reached.

4,705,668

ELECTROLYTE ANALYZER

Karl W. Kaltenbach, Newtonville; Stephen Rettew, Newton; John O. Rudy, Cambridge, all of Mass., and Gabor L. Szakacs, Nashua, N.H., assignors to Medica Corporation, Bedford, Mass.

Division of Ser. No. 716,670, Mar. 27, 1985, Pat. No. 4,649,028. This application Oct. 14, 1986, Ser. No. 900,784

Int. Cl.[4] G01N *35/08, 27/26*

U.S. Cl. 422—82 **13 Claims**

1. An analyzer for measuring the ionic values of electrolytes in a sample solution comprising:

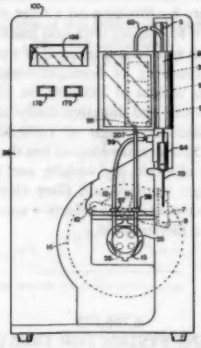
a. means for measuring the ionic values of electrolytes in a sample solution;

b. a tubular sampling probe having two ends, one end being closed, a side port spaced a finite distance from the closed end, and the other end of the probe being in fluid communication with the measuring means;

c. a slide valve a cylindrical passageway through which the probe reciprocates, the passageway having a plurality of chamber ports each of which is sealed from the other ports by the sampling probe when the sampling probe is positioned within the cylindrical passageway, each chamber port communicating with opening means on one face of the slide valve, the the plurality of opening means having a predetermined geometric pattern;

d. a container pack containing a plurality of flexible pouches for containing reagents, each pouch having an opening containing a fitment sealed to the pouch, the pouches being disposed in the container pack with their fitments

being in juxposition, the container pack having an opening in its perimeter containing and holding in place the juxtapositioned fitments, the fitments each having a connector in fluid communication with the space defined by a pouch, the connector being compatible with the openings in the slide valve and extending outwardly from the container pack in the same predetermined pattern as the openings in the slide valve, whereby the container pack can be plugged into, and unplugged from, the slide valve;



e. means for sequentially aspirating and pumping reagents contained in the pouches through the probe, the side valve, sampling probe, and the measuring means, and

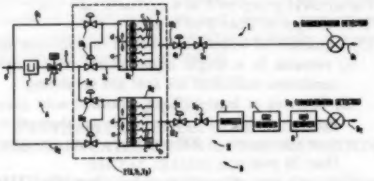
f. means for reciprocating the sampling probe through the passageway in the slide valve, and for sequentially locating the side port in each chamber port in the slide valve and at a finite distance outside the slide valve to aspirate a sample solution from a sample container.

4,705,669

GAS ANALYZER FOR SIMULTANEOUSLY MEASURING MANY INGREDIENTS

Katsuya Tsuji; Masahiro Tanimoto; Akihiro Hirano, and Takeshi Yamada, all of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Aug. 27, 1986, Ser. No. 901,046
Claims priority, application Japan, Oct. 19, 1985, 60-235943
Int. Cl.[4] G01N *35/08*
U.S. Cl. 422—93 **1 Claim**



1. A gas analyzer for simultaneously measuring a plurality of ingredients of a sample gas, comprising:

a sample gas-introducing passage;

a sample gas flow-dividing and gas-diluting means connected to said gas-introducing passage for dividing the sample gas into a plurality of gas flow in a desired flow-dividing ratio, and simultaneously diluting the plurality of divided sample gas flows, said means having a plurality of parallel connected flow-dividing ratio/dilution ratio setting devices; each of said ratio setting devices having a plurality of parallel connected flow rate limiting elements, and having an inlet manifold providing a space from which said limiting elements extend with the openings into the inlet elements side by side, the outlets from said limiting elements being connected in an outlet manifold, and a valve means movable in said inlet manifold and selectively positionable between individual pairs of element inlet openings and dividing said inlet manifold space into two non-communicating parts, thereby causing the openings on one side of said valve means to open into one part of the inlet manifold space and the openings on the other side of said valve means to open into the other part of said inlet manifold space, said sample gas-introducing passage being connected to one part of said inlet maifold space, and dilution gas supply means connected to the other part of said inlet manifold space; and

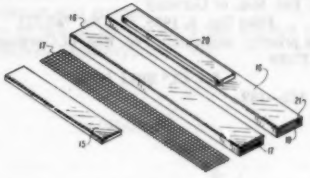
a plurality of gas concentration detectors, one for the gas flow from each of said ratio setting devices, and connected, in parallel with each other, to their respective outlet manifolds for receiving the respective diluted gas flows from said outlet manifolds of each of said flow-dividing ratio/dilution ratio setting devices.

4,705,670

MULTIPLE OXIDATION NITROGEN FIXATION

Louis R. O'Hare, 1066A County Rd. 335, Pagosa Springs, Colo. 81147

Filed Sep. 3, 1985, Ser. No. 772,137
Int. Cl.[4] C01B *21/32*
U.S. Cl. 422—186.04 **4 Claims**



1. An electric discharge reactor for the production of nitric acid comprising:

an electrically insulating casing in the form of a long rectangular box of high dielectric strength and high thermal shock resistance defining a chamber for both high voltage discharge of about 6000 volts or more and for discharge products absorbtion, and having inlet opening means and outlet opening means for gas and for liquid solution communicating with said chamber;

an electrically conductive liquid electrode flowing through said discharge chamber along the base of the chamber and beneath a discharge zone in the chamber and in physical and electric contact with the discharge, said liquid electrode being an aqueous solution of multiple products of said electric discharge;

an electric discharge electrode plate in physical contact along its lower surface with the top side of said chamber and electrically installed from said discharge zone and from said liquid electrode by the dielectric top side of said casing, thereby producing electric capacitance across said discharge zone for limiting the energy of the discharge and for causing the discharge to be diffused out across the space between the electrodes, thereby controlling the energy density of the discharge through the discharge zone;

power source means for applying a high voltage discharge potential between said plate electrode and said liquid electrode within said chamber, thereby producing an electric discharge within said discharge chamber to form nitric oxide, hydrogen peroxide and ozone, as first products, from nitrogen, oxygen and water supplied to said chamber through said inlet opening means, said first products being absorbed and reacted in said liquid electrode to

form nitric acid, said nitric acid being removed from said chamber through said liquid outlet opening means, said power source means including an a.c. high voltage power source which provides from 6000 volts to 20,000 volts connected between said discharge electrodes;

liquid electrode, aqueous solution circulation and cooling means to flow said solution through said chamber in multiple repeated cycles for absorbing the first products of the discharge and then to react them in said solution thereby making said solution increasingly more absorbtive of said gas discharge products, said circulation and cooling means being in the form of a small liquid pump and ducting with cooling fins in circular series fluid flow communication with said reaction chamber through said inlet and exit opening means, said ducting having inlet and exit valves with ports for admitting water and for exiting product nitric acid.

4,705,671

APPARATUS FOR REDUCING IRON AND VANADIUM IN PHOSPHORIC ACID SOLUTION

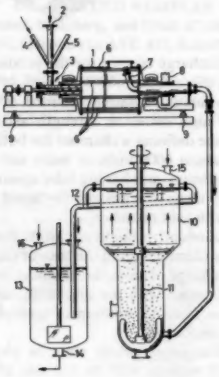
Herbert Ressel, Erftstadt, and Wilhelm Westphal, Brühl, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 1, 1985, Ser. No. 782,722

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1984, 3437689

Int. Cl.⁴ B01J *19/28*

U.S. Cl. 422—189 **4 Claims**



1. An apparatus for reducing iron and vanadium in a phosphoric acid solution with the aid of a granular reductant comprising a drum filled with phosphoric acid and a granular reductant, means connected to rotate the drum around a substantially horizontal axis, drum inlets for supplying the phosphoric acid, the granular reductant and an inert gas, and a drum outlet for discharging reacted phosphoric acid, the drum outlet comprising a tube having a first portion disposed horizontally and axially within the drum and an upwardly directed second portion inclined so that an open upper end of this portion is adjacent to an upper portion of the interior of the rotating drum thereby permitting maintenance of the level of the phosphoric acid within the drum at the level of the open upper end of the tube and simultaneously preventing the solid granular reductant from being discharged from the drum.

4,705,672

PROCESS TO IMPROVE THE REMOVAL OF SUSPENDED SOLIDS IN LEACHED URANIUM ORE CLARIFICATION

John W. McCurdy, Toronto, and Brian H. Danyliw, Lively, both of Canada, assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Apr. 28, 1986, Ser. No. 856,552

Int. Cl.⁴ C01G *56/00, 57/00;* **B01D** *21/01;* **C02F** *1/52*

U.S. Cl. 423—3 **1 Claim**

1. A process to improve suspended solids removal from leached uranium ore by filtration on a filter cloth comprising (a) contacting, prior to contact with said leached uranium ore, said filter cloth with an effective amount of a polymer selected from the group consisting of homopolymers of acrylamide having a molecular weight of 3,000,000 to 8,000,000 and copolymers of acrylamide and dimethyl diallyl ammonium chloride having a molecular weight of 1,000,000 to 8,000,000, containing at least 50% acrylamide and less than 50% dimethyl diallyl ammonium chloride, by weight; and (b) passing said leached uranium ore through said filter cloth, wherein said leached uranium ore contains an effective amount of an acrylamide polymer as a filtration aid.

4,705,673

MIXED SOLVENT SYSTEM FOR TREATING ACIDIC GAS

Paul J. Capobianco, Brooklyn; Kenneth F. Butwell, Newburgh, both of N.Y., and Edward J. Kossakowski, North Brunswick, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 659,443, Oct. 10, 1984, abandoned. This application Apr. 22, 1986, Ser. No. 854,506

Int. Cl.⁴ C01B *17/16, 31/20;* **C09K** *3/00*

U.S. Cl. 423—229 **14 Claims**

1. A process of acid gas scrubbing comprising:

(a) circulating in a gas scrubbing apparatus a solvent mixture having:

(1) methyl diethanolamine;

(2) a physical solvent which is a member selected from the group consisting of a compound, or a mixture of compounds, having a mono alkyl ether of a polyethylene glycol with a general formula:

$$R1—O—(CH_2CH_2O)_X—H$$

wherein

R1 is an alkyl group of 1 to 4 carbon atoms and

X is an integer of from 2 to 5; and

(3) a quantity of water and wherein said solvent mixture:

(i) remains in a single liquid phase under operating conditions sufficient for acid gas scrubbing.

(ii) liberates at least 60% of absorbed acid gases in a pressure swing process wherein an absorption pressure is in excess of 400 psia and a flash pressure is less than 20 psia;

(iii) has a heat of reaction of less than 500 BTU/lb. of CO_2 absorbed; and

(iv) possesses an effective working capacity of greater than about 5 weight percent between carbon dioxide partial pressures of 4 and 100 psia at a temperature of 40° C.;

(b) contacting said solvent mixture in an absorber tower of said gas scrubbing apparatus with a gas stream containing acid gases such that said acid gases are absorbed into said solvent mixture; and

(c) regenerating by a pressure swing system in said gas scrubbing apparatus said solvent mixture such that said absorbed acid gases are at least in part eliminated from said solvent mixture.

4,705,674
SYNTHESIS OF ZEOLITE EU-13 FROM A REACTION MIXTURE CONTAINING TETRAMETHYLAMMONIUM COMPOUND

Abraham Araya, Merseyside, England, and Barrie M. Lowe, Edinburgh, Scotland, assignors to Imperial Chemical Industries PLC, London, England

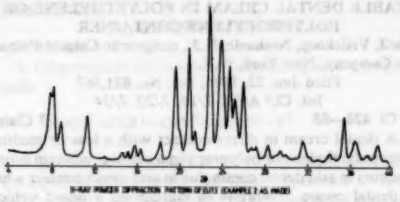
Continuation of Ser. No. 538,472, Oct. 3, 1983, abandoned. This application Dec. 5, 1985, Ser. No. 804,631

Claims priority, application United Kingdom, Oct. 5, 1982, 8228353

The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.

Int. Cl.[4] C01B *35/10*

U.S. Cl. 423—277 **5 Claims**



1. A method of making a crystalline zeolite material, designated EU-13 having a molar composition (in terms of mole ratios of oxides) expressed by the formula:

0.8 to 3.0 R_2O:Y_2O_3:at least 10 XO_2:0 to 2000 H_2O

wherein R is a monovalent cation or (1/n) of a cation of valency n, X is silicon and/or germanium, Y is one or more of aluminium, iron, chromium, vanadium, molybdenum, arsenic, antimony, manganese, gallium or boron and H_2O is water of hydration additional to water notionally present when R is H, and having an X-ray powder diffraction pattern as set out in Table 1 (as determined by standard technique using copper Kα radiation) and as shown in FIG. 1, which comprises reacting an aqueous mixture containing sources of at least one oxide XO_2, at least one oxide Y_2O_3 and a tetramethylammonium compound, the reaction mixture having the molar composition:

XO_2/Y_2O_3 in the range 20 to 120

M^1OH/XO_2 in the range 0.04 to 1.0

H_2O/XO_2 in the range 10 to 100

A/XO_2 in the range 0.01 to 0.5

M^2Z/XO_2 in the range 0 to 0.5

wherein each of M^1 and M^2 represents an alkali metal selected from potassium, rubidium, lithium and caesium, ammonium or hydrogen, A represents the tetramethylammonium compound and Z represents a strong acid radical.

4,705,675
SYNTHESIS OF MOLECULAR SIEVING METALLOSILICATES USING SILICA-TRANSITION METAL OXIDE SOLS

Michael J. Desmond, Cleveland Hts.; Marc A. Pepera, Northfield Center, and James L. Callahan, Wooster, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Nov. 16, 1984, Ser. No. 672,286

Int. Cl.[4] C01B *33/20*

U.S. Cl. 423—326 **30 Claims**

1. A method for making a molecular sieving metallosilicate comprising the steps of:

(A) providing an aqueous colloidal dispersion of colloidal particles comprising silica cores coated with the oxide of a transition metal selected from the group consisting of Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Zn, Zr, Y or a mixture of two or more of said metals;

(B) mixing an effective amount of an mineralizing agent and/or synthesis directing agent with said dispersion to form a gel; and

(C) maintaining said gel at a temperature of about 80° C. to about 300° C. for an effective period of time to provide said metallosilicate.

4,705,676
RECOVERY OF SULFUR FROM A SOLID SULFUR-CONTAINING SOLUTION OF A SOLUBILIZED IRON CHELATE

Howard L. Fong, Sugarland; Zaida Diaz, and George C. Blytas, both of Houston, all of Tex., assignors to Shell Oil Company

Filed Aug. 23, 1985, Ser. No. 769,197

The portion of the term of this patent subsequent to May 12, 2004, has been disclaimed.

Int. Cl.[4] C01B *17/00, 17/02, 17/16, 31/20*

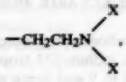
U.S. Cl. 423—567 A **34 Claims**

1. A process for recovering sulfur from a solid sulfur-containing solution of a solubilized iron chelate of an acid having the formula

wherein

from two to four of the groups Y are selected from acetic and propionic acid groups;

from zero to two of the groups Y are selected from 2-hydroxyethyl, 2-hydroxypropyl, and



wherein X is selected from acetic acid and propionic acid groups; and

R is ethylene, propylene or isopropylene or alternatively cyclohexane or benzene where the two hydrogen atoms replaced by nitrogen are in the 1,2 position, and mixtures thereof, comprising

(a) introducing said solid sulfur-containing solution into an at least substantially oxygen-free zone containing an upper phase comprising a subtantially sulfur-free solution of solubilized iron chelates of said acid or mixture of said acids and a lower phase comprising molten sulfur, the temperature of the zone being maintained at a temperature sufficient to melt the sulfur added, and allowing the solid sulfur added to melt and become part of the lower phase; and

(b) recovering molten sulfur from the lower phase.

4,705,677
IMMUNIZATION

Jack G. Makari, 88 Everett Rd., Demarest, N.J. 07627

Continuation of Ser. No. 564,015, Dec. 21, 1983, abandoned, which is a continuation-in-part of Ser. No. 793,294, May 3, 1977, abandoned, which is a continuation-in-part of Ser. No. 159,473, Jul. 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 535,364, Mar. 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 421,683, Dec. 28, 1964, abandoned, which is a continuation-in-part of Ser. No. 75,454, Aug. 26, 1959, abandoned. This application Jul. 17, 1986, Ser. No. 888,261

Int. Cl.[4] A61K *43/00*

U.S. Cl. 424—1.1 **2 Claims**

1. A method of enhancing the defense mechanisms of the body of a mammal against malignant tumor incipience, which

method comprises administering to said mammal a tumor-antibody-stimulating effective dosage of

(a) a glycoprotein-polysaccharide-like antigenic substance derived from cancerous tissue and which disperses readily and is stable in cold to boiling water and in aqueous saline solution, non-dialyzable at a molecular weight cut-off point of 3500, inert to alkali and to isotonic phosphate buffered saline solution, precipitated from aqueous medium by isopropanol and insoluble in isopropanol ether, chloroform, and butanol, gives a positive Molisch test and negative Dische test, and on hydrolysis with dilute sulfuric acid at about 100° C., followed by deionization, yields a hydrolysate containing identifiable sugars, and on finite analysis shows trace amounts of amino acids typical of N-glycoproteins; which substance when in an aqueous vehicle and on therein being admixed with blood serum yields a preparation which when injected intra-dermally into a subject to be tested, produces an erythema about the injection site; and

(b) the tritiated form of the antigenic substance of (a); at an adequate regimen, to develop an improved level of defense against said malignant tumor incipience.

2. The method of claim 1, wherein there also is administered malignant tumor-derived deoxyribonucleic acid.

4,705,678

STERILE RADIOACTIVE INDIUM-CONTAINING AQUEOUS SOLUTION

Wilhelmus T. Goedemans, Schoorldam, Netherlands, assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jun. 29, 1984, Ser. No. 626,080

Claims priority, application Netherlands, Jul. 7, 1983, 8302422; Dec. 2, 1983, 8304142

Int. Cl.[4] A61K *49/00*

U.S. Cl. 424—1.1 **8 Claims**

1. A solution for radioassaying comprising a heat sterile solution of radioactive indium-111 tropolonate, said solution having a pH of from 4 to 9 and being substantially free from organic solvent, said solution additionally containing a substance which under labelling conditions generates carbon dioxide.

4,705,679

TRANSPARENT DENTAL CARE COMPOSITION

Karl-Hans Müller, Bruchköbel; Matthias Neumüller, Hasselroth, and Günther Türk, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Division of Ser. No. 773,973, Sep. 9, 1985, Pat. No. 4,664,907, which is a continuation of Ser. No. 641,812, Aug. 17, 1984, abandoned, which is a continuation of Ser. No. 510,452, Jul. 1, 1983, abandoned, which is a continuation of Ser. No. 364,035, Mar. 31, 1982, abandoned. This application Jan. 27, 1987, Ser. No. 7,214

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114492

Int. Cl.[4] A61K *7/16, 7/18*

U.S. Cl. 424—52 **19 Claims**

1. A transparent dental-care toothpaste composition having a smooth, speck-free and glossy ribbon as well as improved shelf life in respect of rheology and abrasiveness, which comprises a sufficient amount of water, an abrasive agent which is a precipitated silica characterized by the following physicochemical properties:

BET surface area determined according to DIN 66,131	m^2/g	15–110
Tamped density	g/l	150–750
Secondary particle size distribution curve according to Coulter counter		according to FIG. 1
"ALPINE" screen retainings >63 μm	% by weight	<1.5
Cu abrasion in 10% strength glycerol dispersion	mg	5–30
Viscosity of a 30% strength dispersion in a 1:1 water/glycerol mixture (Brookfield RTV Sp 5)	mPa.s	30,000–60,000
Lightness value A according to DIN 55,921	%	86–96

and an additional precipitated silica.

4,705,680

STABLE DENTAL CREAM IN POLYETHYLENE OR POLYPROPYLENE CONTAINER

Linda J. Vellekoop, Neshanic, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 22, 1986, Ser. No. 821,567

Int. Cl.[4] A61K *7/16, 7/20, 7/24*

U.S. Cl. 424—55 **7 Claims**

1. A dental cream in direct contact with a low or medium density polyethylene or polypropylene surface, wherein syneresis occurs in said dental cream due to said direct contact when said dental cream comprises as ingredients a liquid vehicle comprising about 10–50% by weight of water and glycerine and sorbitol, the amount of glycerine and sorbitol being about 15–50% by weight, the weight ratio of glycerine to sorbitol being from about 0.25:1 to about 3:1, about 0.05–10% by weight of gelling agent consisting essentially of sodium carboxymethyl cellulose and about 20–75% by weight of a dentally acceptable water-insoluble alkaline earth metal salt polishing agent selected from the group consisting of dicalcium phosphate dihydrate, anhydrous dicalcium phosphate, calcium carbonate, tricalcium phosphate, calcium pyrophosphate, dimagnesium phosphate trihydrate and magnesium carbonate and as an additive which prevents syneresis in said dental cream upon said direct contact about 0.2–5% by weight of a vegetable oil which disperses readily in said liquid vehicle, said vegetable oil being selected from the group consisting of coconut oil, palm oil, peanut oil and safflower oil.

4,705,681

HAIR TREATING COMPOSITION

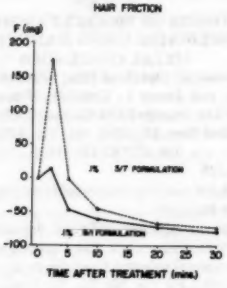
Daniel Maes, Monroe, Conn., and Norman Brudney, Paris, France, assignors to Richardson-Vicks Limited, Egham, England

Filed Mar. 20, 1985, Ser. No. 713,890

Claims priority, application European Pat. Off., Mar. 21, 1984, 84103104

Int. Cl.[4] A61K *7/06, 7/42*

U.S. Cl. 424—70 **5 Claims**



1. In a hair care composition for the treatment of hair the

improvement comprising employing in said composition 9 parts by weight d-panthenyl ethyl ether per 1 part by weight d-panthenol for a combined weight of from about 0.05% to about 1.0%, based on the weight of the composition.

4,705,682

OLIGOPEPTIDE DERIVATIVES, THEIR PRODUCTION AND THEIR USE AS SURFACTANTS GENTLE TO THE SKIN

Hinrich Moeller, Monheim, and Ulrich Zeidler, Duesseldorf, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed May 6, 1986, Ser. No. 860,143

Claims priority, application Fed. Rep. of Germany, May 13, 1985, 3517205

Int. Cl.[4] C07K *1/12*; C08H *1/06*

U.S. Cl. 424—70 **27 Claims**

1. Oligopeptide derivates corresponding to the general formula

$$MOOC—CHR^1—CHR^2—COHN—R^3 \quad (I)$$

in which one of the groups R^1 or R^2 represents hydrogen or a C_1–C_4 alkyl group while the other represents at least one C_6–C_{22} alkyl or alkenyl group; R^3 represents the residue of an oligopeptide which has been obtained by partial hydrolysis of an animal or vegetable protein to a hydrolyzate having an average molecular weight of from 200 to 20,000 and M represents hydrogen or an alkali, alkaline-earth, ammonium, mono-, di- or trialkanolammonium ion containing from 1 to 4 carbon atoms in the alkanol group.

4,705,683

PHARMACEUTICAL COMPOSITIONS

Peter W. Dettmar, Welwick, Great Britain, assignor to Reckitt & Colman Products Limited, Great Britain

Filed Feb. 26, 1986, Ser. No. 832,995

Claims priority, application United Kingdom, Mar. 1, 1985, 8505298; Mar. 16, 1985, 8506855

Int. Cl.[4] A61K *31/78, 31/415*

U.S. Cl. 424—81 **13 Claims**

10. A method of treating gastritis or gastro-duodenal ulcers which comprises administration to a patient an orally effective amount of a pharmaceutical composition comprising a histamine H_2-receptor antagonist and a polyacrylate selected from the group consisting of sodium, potassium and ammonium polyacrylates or mixtures thereof having molecular weights between approximately 450,000 and approximately 4,000,000 in a weight ratio of from 5:1 to 1:5.

4,705,684

SYNTHETIC M PROTEINS - STREPTOCOCCI TYPE 6

Edwin H. Beachey, Memphis, Tenn., assignor to The University of Tennessee Research Corporation, Knoxville, Tenn.

Continuation-in-part of Ser. No. 739,963, May 31, 1985, abandoned. This application Mar. 14, 1986, Ser. No. 839,750

Int. Cl.[4] A61K *37/02*; C07K *7/06, 7/08, 7/10*

U.S. Cl. 424—88 **21 Claims**

1. A synthetic polypeptide which comprises the amino acid sequence

X-Lys-Ala-Arg-Glu-Leu-Leu-Asn-Y

wherein X is Asp, Asn-Pro-Asp or Arg-Val-Phe-Pro-Arg-Gly-Thr-Val-Glu-Asn-Pro-Asp

and Y is Lys or Lys-Tyr-Asp-Val-Glu-Asn-Ser-Met-Leu-Gln-Ala-Asn.

4,705,685

METHODS AND MATERIALS FOR TREATMENT OF DISEASE STATES INVOLVING IMMUNOLOGICAL FACTORS

John McMichael, Cambridge Springs, Pa.

Division of Ser. No. 378,752, May 17, 1982, Pat. No. 4,521,405. This application Mar. 5, 1985, Ser. No. 708,274

Int. Cl.[4] A61K *39/165*

U.S. Cl. 424—89 **7 Claims**

1. A method for alleviating chronic pain symptoms comprising administering to the disease victim an effective amount of a composition comprising a mixture of histamine and inactivated, attenuated measles virus or an immunologically active fraction thereof.

4,705,686

PROCESS FOR THE PREPARATION OF ACELLULAR *BORDETALLA PERTUSSIS* VACCINE

Jane V. Scott, Chappaqua, and Joseph F. Waggett, New City, both of N.Y., assignors to American Cyanamid, Stamford, Conn.

Filed May 9, 1986, Ser. No. 861,698

Int. Cl.[4] C12N *1/20*; A61K *39/02, 39/10*

U.S. Cl. 424—92 **7 Claims**

1. A process for the preparation of an acellular *Bordetella pertussi* vaccine which comprises:

(a) mixing in the presence of a neutral buffer solution of low ionic strength comprising about 0.005M sodium phosphate, pH 7.2, and about 0.05 to about 0.1M sodium chloride and about 0.01% thimerosal an extract of *B. pertussis* cells or the supernatant of a *B. pertussis* culture with an anion exchange resin selected from the group consisting of Whatman DE-52, Whatman DE-53 and SEPHADEX ® DEAE-A-50;

(b) loading the mixture into a column;

(c) eluting the column; and

(d) detoxifying the eluate.

4,705,687

TREATMENT OF AUTOIMMUNE DISEASES SUCH AS RHEUMATOID ARTHRITIS WITH SUPPRESSOR FACTOR

Catherine Y. Lau, Unionville, Canada, assignor to Ortho Pharmaceutical (Canada) Ltd., Canada

Filed Jun. 17, 1985, Ser. No. 745,116

Int. Cl.[4] A61K *35/12*

U.S. Cl. 424—95 **20 Claims**

1. A method for the treatment of a systemic or organ-specific autoimmune disease in a human in need of such treatment which comprises parenterally administering to the human an amount of a factor sufficient to alleviate the severity of the symptoms of said disease wherein said factor:

(i) is secreted by a stable 6-thioquanine-resistant mutant of the lymphoblastoid cell line CEM,

(ii) is non-mitogenic,

(iii) is non-cytotoxic, and

(ix) exhibits a greater suppressive effect on autoantibody production than on antibody to rat erythrocyte foreign antigens in a mouse immunized with said foreign antigens.

4,705,688

ANTIBIOTIC LL-E19020 α AND β

Guy T. Carter; Michael Greenstein, both of Suffern; Joseph J. Goodman, Spring Valley; Donald B. Borders, Suffern, all of N.Y.; William M. Maiese, Bridgewater, and Raymond T. Testa, Cedar Grove, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 30, 1986, Ser. No. 880,230

Int. Cl.[4] A61K *35/74*; C12P *1/06*

U.S. Cl. 424—122 **8 Claims**

1. The compound LL-E19020 ALPHA which comprises:

(a) an elemental analysis: C 62.73; H 7.60; N 1.00; O 28.67 (by difference);
(b) a molecular weight of 1225 (FABMS);
(c) a specific optical rotation: $[\alpha]_D^{26}=0$; (C 0.385, methanol);
(d) a characteristic ultraviolet absorption spectra as shown in FIG. I of the attached drawings;
(e) a characteristic infrared absorption spectrum as shown in FIG. II of the attached drawings;
(f) a characteristic proton nuclear magnetic resonance as shown in FIG. III of the attached drawings; and
(g) a characteristic carbon-13 nuclear magnetic resonance spectrum as shown in FIG. IV of the attached drawings.

2. The compound LL-E19020 BETA which comprises:
(a) an elemental analysis: C 63.33; H 7.72; N 1.16; O 27.79 (by difference);
(b) a molecular weight of 1225 (FABMS);
(c) a specific optical rotation: $[\alpha]_D^{26}=-17\pm2$ (C 0.455, methanol);
(d) characteristic ultraviolet absorption spectrum as shown in FIG. V of the attached drawings;
(e) a characteristic infrared absorption spectrum as shown in FIG. VI of the attached drawings;
(f) a characteristic proton nuclear magnetic resonance spectrum as shown in FIG. VII of the attached drawings; and
(g) a characteristic carbon-13 nuclear magnetic resonance spectrum as shown in FIG. VIII of the attached drawings.

4,705,689

USE OF AQUEOUS SODIUM OR POTASSIUM METHIONINATE SOLUTION FOR SUPPLEMENTAL MIXED FODDERS WITH METHIONINE

Herbert Tanner; Heidrun-Leonore Bertram, both of Hanau; Reinhard Richter, Rodenbach, and Manfred Spindler, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 346,154, Feb. 5, 1982, abandoned. This application Dec. 9, 1985, Ser. No. 806,133

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1981, 3105009

Int. Cl.[4] A23K *1/22*

U.S. Cl. 426—2 **12 Claims**

1. A process of supplying methionine to an animal consisting of feeding the animal a mixed fodder consisting of conventional feed components and about 0.01 to about 5.0 weight percent of an aqueous solution of sodium or potassium methioninate, the aqueous solution containing 40 to 65 weight percent of sodium methioninate or 20 to 50 weight percent of potassium methioninate.

4,705,690

WEIGHTING OIL SUBSTITUTES

Larry M. Brand, West Chester, and Harry C. McDaniel, Cincinnati, both of Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Filed Nov. 18, 1985, Ser. No. 799,084

The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.

Int. Cl.[4] A23L *2/00*

U.S. Cl. 426—590 **13 Claims**

1. A beverage weighting oil consisting essentially of an edible, non-absorbable, non-toxic, non-digestible liquid brominated polyol fatty acid polyester having at least 4 fatty acid ester groups, wherein the polyol is selected from the group consisting of sugars and alcohols containing at least 4 hydroxyl groups, and wherein each fatty acid group has from about 8 to about 22 carbon atoms.

4,705,691

BEVERAGE OPACIFIER

Philip L. Kupper, and Dan R. Morgan, both of Cincinnati, Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Filed Nov. 18, 1985, Ser. No. 799,370

The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.

Int. Cl.[4] A23L *2/00*

U.S. Cl. 426—590 **31 Claims**

1. A beverage opacifier comprising:
(a) one or more triglyceride fats as a clouding agent; and
(b) one or more weighting agents selected from the group consisting of sucrose esters and brominated polyol fatty acid esters having at least 4 fatty acid ester groups, wherein the polyol is selected from the group consisting of sugars and alcohols containing at least 4 hydroxyl groups, and wherein each fatty acid group has from about 8 to about 22 carbon atoms;
(c) wherein the ratio of said clouding agent to said weighting agent is from about 250:1 to about 1:2.

4,705,692

SUBSTITUTE COMPOSITION FOR COCOA BUTTER

Yukitaka Tanaka; Yuichi Irinatsu, both of Hasakimachi; Aiko Noguchi, Kasumimachi, and Takashi Kobayashi, Hasakimachi, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Mar. 3, 1987, Ser. No. 21,110

Claims priority, application Japan, Mar. 11, 1986, 61-53353

Int. Cl.[4] A23D *5/00*

U.S. Cl. 426—607 **1 Claim**

1. A substitute composition for cocoa butter which comprises 5 to 60% by weight of an oleaginous composition (A) and 40 to 95% by weight of another oleaginous composition (B) each as specified hereinbelow;
(A) an oleaginous composition which comprises 40 to 100% by weight of mixed acid triglyceride(s) containing 15 to 70% by weight of saturated fatty acid(s) having 20 to 24 carbon atoms and 20 to 60% by weight of unsaturated fatty acid(s) having 16 to 22 carbon atoms as constituent fatty acids and containing at least one saturated fatty acid residue having 20 to 24 carbon atoms and at least one unsaturated fatty acid residue having 16 to 22 carbon atoms per molecule; and (B) an oleaginous composition which contains at least 70% by weight of 1,3-disaturated-2-oleoylglycerols comprising 1,3-dipalmitoyl-2-oleoylglycerol, 1-palmitoyl-2-oleoyl-3-stearoylglycerol and 1,3-distearoyl-2-oleoylgylcerol and shows a weight ratio of stearic acid to palmitic acid in the constituent fatty acid residues of 1.5:1 to 6.0:1.

4,705,693

VEGETABLE FOOD PATTIE COMPOSITION AND PROCESS

Gayatri Mitra, and Grihapati Mitra, both of 161 Price St., Kingston, Pa. 18704

Filed Sep. 24, 1985, Ser. No. 779,425

Int. Cl.[4] A23L *1/20*

U.S. Cl. 426—629 **5 Claims**

1. A process for preparing an edible vegetable pattie product consisting essentially of:
a. combining beans selected from the group consisting of lima beans, naval beans, pinto beans, kidney beans and red lentil beans and peas selected from the group consisting of black-eyed peas, chick peas, yellow split peas and toor peas in proportion of from about one part beans to one part peas to about one part beans to three parts peas;
b. boiling the combination of (a) in water until said peas and beans are soft;
c. forming the resultant soft pea and bean mixture into a paste wherein the water content is about fifty percent (50%) by weight and whereby the composition is suitable for pattie formation;

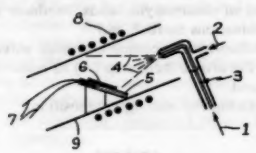
d. adding a filler to the paste in a proportion less than about twenty-four percent (24%) by weight to form a second paste;
e. adding spices to the second paste to form a third paste;
f. adding an antioxident preservative to the third paste to form a resultant combination;
g. mixing the resultant combination to form a homogeneous mixture;
h. forming the homogeneous mixture of step (g) into a pattie.

4,705,694

PROCESS FOR MAKING BIOACTIVE COATINGS ON OSSEOUS PROSTHESES, AND PROSTHESES THUS OBTAINED

Bernard Buttazzoni, Marseille; Philippe Leseur, La Rochelle; Jacques Thebault, Bordeaux, all of France and Georges Constant, deceased, late of Ramonville Saint-Agne, France (by Marie-Josette Constant, Francoise Constant, Philippe Constant, executors), assignors to Societe Europeenne de Propulsion, Puteaux, France

Continuation-in-part of Ser. No. 626,901, Jul. 2, 1984, abandoned. This application Nov. 12, 1986, Ser. No. 929,716
Claims priority, application France, Jul. 1, 1983, 83 11026
Int. Cl.[4] A61C *13/30*; A61F *1/24*
U.S. Cl. 427—2 **1 Claim**



1. Process for making, on osseous prostheses substrates, bioactive coatings based on calcium-deficient hydroxyapatites having a Ca/*p* ratio higher than 1.2, said process comprising the steps of forming, from aqueous solutions of dibasic calcium phosphate, a mist of droplets containing calcium ions and orthophosphate ions and bringing said mist into contact with the substrate made in an inert material appropriately heated, said process comprising the steps of:
(1) placing an osseous prosthesis substrate made of an inert material on a support;
(2) heating said support to between 250° and 500° C.;
(3) atomizirgon said substrate a saturated aqueous solution of a dibasic calcium phosphate maintained at a temperature between 5° and 30° C., said solution being carried by air or by an inert atomizing gas under the form of a mist of droplets in such conditions that, for one cm2 of the substrate to be coated, the flow rate of the atomizing gas is higher than 4.5 l/min and the flow rate of the solution is higher than 200 ml/hr.

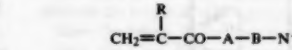
4,705,695

METHOD FOR COATING PHARMACEUTICAL FORMULATIONS

Klaus Lehmann, Rossdorf; Dieter Dreher, Darmstadt, and Harry Goetz, Alsbach-Haehnlein, all of Fed. Rep. of Germany, assignors to Röhm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Jun. 13, 1985, Ser. No. 744,330
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1984, 3421860; Jul. 19, 1984, 3426587
Int. Cl.[4] A61K *9/32*
U.S. Cl. 427—3 **7 Claims**

1. A method for coating solid pharmaceutical formulations, comprising coating said solid formulation with an aqueous fluid, film-forming coating medium, the liquid component of which medium is comprised primarily of water, said method further comprising drying of the film: characterized in that a coating medium is employed the binder of which consists essentially of:
(a) a polymer dissolved in the liquid component, which polymer is comprised of acrylic and/or methacrylic monomers, and is further comprised of side groups having a tertiary ammonium salt group, the nitrogen atom of which is covalently bonded to the side group, said polymer comprised of a homo- or copolymer of monomers of structure



wherein
R is a hydrogen atom or a methyl group;
A is an oxygen or an —NH— group;
B is an aliphatic or araliphatic hydrocarbon group with 2–8 C atoms;
R^1 and R^2 are identical or different alkyl groups with 1–6 C atoms, or alicyclic groups, or together form an alkyl chain which may be broken by an oxygen atom or by an —NH— group; and
X^- represents monovalent acid anion or one equivalent of a polyvalent acid anion; and
(b) a dispersed film-forming binder which is insoluble in the coating medium and which comprises the preponderant part of the total binder content of the coating medium.

4,705,696

METHOD OF MAKING A LITHOGRAPHIC PRINTING PLATE, PRINTING PLATES MADE BY THE METHOD, AND THE USE OF SUCH PRINTING PLATES TO MAKE LITHOGRAPHIC PRINTS

Peter J. Calabrese, Montville, and Galina Pismennaya, Palisades Park, both of N.J., assignors to Olin Hunt Specialty Products Inc., Palisades Park, N.J.

Filed Sep. 27, 1984, Ser. No. 655,218
Int. Cl.[4] B41M *1/06, 1/10*
U.S. Cl. 427—14.1 **20 Claims**

1. A method of making a lithographic printing plate comprising the steps of:
(a) selectively applying an electrostatic charge directly to the anodized surface of an anodized aluminum wipe-on printing plate in a predetermined pattern corresponding to the image to be printed;
(b) applying a liquid toner to the charged portions of the anodized surface; and
(c) fixing the toner to the surface to provide a lithographic printing plate.

4,705,697

ELECTRON BEAM FORMATION OF A THERMAL HEAD USING TITANIUM SILICIDE

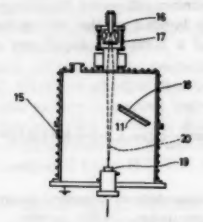
Yasuo Nishiguchi; Keijirou Minami, and Masakazu Hoda, all of Kokubu, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Division of Ser. No. 765,851, Aug. 14, 1985. This application Jun. 25, 1986, Ser. No. 878,416
Claims priority, application Japan, Aug. 17, 1984, 59-172304
Int. Cl.[4] B05D *3/06, 5/12*
U.S. Cl. 427—36 **1 Claim**

1. A method for fabricating a thermal head by forming a layer of a heat-generating resistor on a substrate and forming a layer of an electric conductor on the layer of the heat-generating layer, which comprises placing the substrate and an evaporation source composed of titanium silicide or a combination of silicon and titanium into a vacuum vessel provided with an electron beam-generating device, maintaining said vacuum vessel in an atmosphere containing oxygen and an inert gas under a pressure of from 10^{-4} to 10^{-6} mmHg, and applying

electron beams to said evaporation source to evaporate silicon and titanium, whereby a thin layer of a compound having a composition represented by the following formula:

$Ti_xSi_yO_z$



wherein

x is a number of from 0.25 to 0.45, y is a number of from 0.25 to 0.40 and z is a number of from 0.25 to 0.40, with the proviso that the sum of x, y and z is equal to 1,

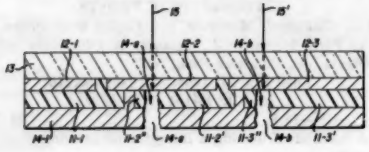
is formed on the substrate.

4,705,698

ISOLATION OF SEMICONDUCTOR CONTACTS

John Van Dine, Westfield, N.J., assignor to Chronar Corporation, Princeton, N.J.

Filed Oct. 27, 1986, Ser. No. 923,350
Int. Cl.[4] B23K *9/00*
U.S. Cl. 427—53.1 **16 Claims**



1. The method of isolating segments from one another which comprises the steps of:

(a) forming a layer on a substrate; and

(b) directing a beam of energy through the substrate to expell disticintive portions of said layer.

4,705,699

METHOD OF COATING MAGNETIC RECORDING MEDIA WITH PERFLUOROPOLYETHER COMPOSITIONS WHICH ARE SOLUBLE IN NON-FLUORINATED SOLVENTS

Mario D. Burguette, Woodbury, Minn., and George D. Foss, River Falls, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 803,141, Dec. 2, 1985, Pat. No. 4,671,999, which is a division of Ser. No. 533,305, Sep. 19, 1983, Pat. No. 4,569,962. This application Feb. 20, 1987, Ser. No. 17,178
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—54.1 **21 Claims**

1. A method of coating articles which comprises the steps of:

(A) contacting said articles with a single phase coating composition which comprises a mixture of

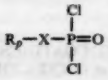
(1) a polymerizable perfluoropolyether comprising a plurality of perfluoroalkylene oxide repeating units;

(2) a solubilizing agent which is

(i) not spontaneously chemically reactive with the perfluoropolyether of part (1),

(ii) soluble to at least one weight percent in both a common, non-fluorinated organic solvent and in a chlorofluorocarbon solvent,

(iii) selected from the group consisting of azotic conjugated compounds selected from the group consisting of iminoquinone dyes, diiminoquinone dyes, and azo dyes, and polymerizable phosphorylated compounds which can be made by reaction of a compound having the formula



in which R_p is an alkyl, cycloalkyl or aromatic group, and X is selected from the group consisting of —O—, —S— and

in which R' is —H or —R_p, with an organic compound selected from the group consisting of α,β-unsaturated carboxylic acid esters of polyhydric phenols, acrylates and methacrylates of glycidyl esters of dicarboxylic acids, urethane acrylates and combinations thereof; and

(3) a non-fluorinated, common organic solvent;

(B) drying the article from step (A) to remove most of the solvent; and

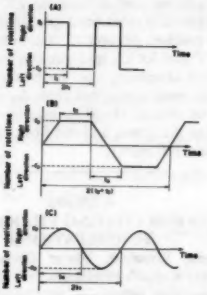
(C) polymerizing the coating composition.

4,705,700

CHEMICAL VAPOR DEPOSITION METHOD FOR THE THIN FILM OF SEMICONDUCTOR

Masakiyo Ikeda, Yokohama; Seiji Kojima; Hiroshi Kikuchi, both of Tokyo, and Yuzo Kashiwayanagi, Yokosuka, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed May 29, 1986, Ser. No. 868,060
Claims priority, application Japan, May 31, 1985, 60-118378
Int. Cl.[4] H01L *21/205*
U.S. Cl. 437—231 **9 Claims**



1. A method for making a semiconductor film by chemical vapor deposition, comprising allowing a semiconductor thin film to deposit onto a semiconductor substrate fitted onto a susceptor having the shape of a frustum, wherein the said susceptor is fitted with a plurality of the said semiconductor substrate onto its side faces and the said susceptor is rotating in a vertical-type reaction tube, wherein source gases and a carrier gas are introduced into the said tube and the said substrates are heated to promote the thermal decomposition of the said

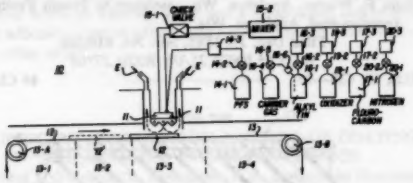
source gases, wherein the number of rotations of the said susceptor is varied in terms of a rectangular wave function, a trapezoidal wave function, or a sine wave function and wherein the said susceptor is allowed to rotate in a converse direction depending on the positive region and the negative region of the said function.

4,705,701

CONDUCTIVE TIN OXIDE METHODS

Masud Akhtar, Lawrenceville, N.J., assignor to Chronar Corporation, Princeton, N.J.

Filed Nov. 14, 1984, Ser. No. 671,213
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—110 **19 Claims**



1. The method of producing transparent and conductive tin oxide, which comprises the steps of

(a) providing a phosphorous fluoride or a non-metallic halocarbon where the halogen consists of fluorine;

(b) providing an organotin compound; and

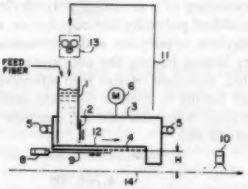
(c) applying the combination of said fluoride or said halocarbon and said organotin compound to a substrate in an oxidizing atmosphere.

4,705,702

PROCESS FOR CONTINUOUSLY DISTRIBUTING FIBROUS MATERIAL AND APPARATUS THEREFOR

Masaaki Shimada; Koji Saito, and Yoshiaki Midorikawa, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 19, 1986, Ser. No. 876,674
Claims priority, application Japan, Jun. 28, 1985, 60-140477
Int. Cl.[4] B05D 1/14
U.S. Cl. 427—180 **22 Claims**



1. A process for distributing a short fibrous material onto a horizontally travelling sheet, comprising the steps of:

(a) feeding a disintegrated short fibrous material into a hopper comprising a substantially hollow chamber disposed above the travelling sheet having a width, and having a fiber discharge port at a lower portion of a side wall located on the side in the travelling direction of the sheet, and

(b) substantially horizontally vibrating a mesh screen in a direction perpendicular to the travelling direction of the sheet to drop and distribute the fiber through the mesh screen onto the sheet travelling below the said mesh screen,

said mesh screen substantially horizontally extending forwardly from below said hopper in the travelling direction of the sheet with a predeterminded distance spaced apart from said travelling sheet,

said mesh screen having a width equal to or larger than that of said travelling sheet and having partitions provided thereabove for suppressing the movement of the fiber in the direction perpendicular to the travelling direction of the sheet;

said mesh screen having a substantially closed approach travel section extending below the hopper and an open screening section subsequent thereto extending in the travelling direction of the sheet and

wherein the length of said approach travel section is 0.5 to 4 times the height of the fiber discharge port as measured from the fiber discharge port to the downstream end thereof.

4,705,703

METHOD OF PREVENTING CORROSION OF UNCOATED ALUMINUM SHEET OR BEVERAGE CANS IN A BREWERY PASTEURIZER WATER SYSTEM

Daniel A. Meier, Naperville, and Michael J. Groshans, Lombard, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jun. 30, 1986, Ser. No. 880,264
Int. Cl.[4] C23F 11/04
U.S. Cl. 427—239 **6 Claims**

1. A method of preventing dome staining of aluminum beverage cans by pasteurizing said cans at temperatures from 70°–190° F. with aqueous solutions having a pH rangng from about 5.0 to 8.5 and containing:

(a) at least 1 ppm, as zinc, of a water soluble zinc salt;

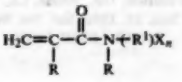
(b) at least 1 ppm, as PO^{-3} of an orthophosphate ion source; and

(c) at least 1 ppm of a zinc ion stabilizing polymer having a molecular weight ranging from 1000–50,000 and chosen from the group consisting of:

(i) homopolymers and copolymers of acrylic acid, methacrylic acid, their water soluble salts, and mixtures thereof;

(ii) copolymers and terpolymers of acrylic acid, methacrylic acid, their water soluble salts and vinylic monomers chosen from (meth)acrylamide and N-alkylated (meth)acrylamide chosen from the group N-methyl (meth)acrylamide, N-ethyl (meth)acrylamide, and N-t-butyl (meth)acrylamide; and

(iii) terpolymers of (meth)acrylic acid, (meth)acrylamide, and an N-substituted (meth)acrylamide represented by the formula:



wherein

R^1 is a hydrocarbon bridging group having from 1–12 carbon atoms and which may be linear or branched alkyl, aryl, alkaryl, arylalkyl, and mixtures thereof;

X is from the group $—SO_3M$, $—NR_2$, $—NR_3Y$, $—O—CH_2CHRO)_mR$, and mixtures thereof;

n is from 1–6; m is from 0–30;

M is, at each occurrence, chosen from H, Na, K, NH_4, and mixtures thereof;

Y is Cl, Br, CH_3SO_4, and mixtures thereof; and

R is, at each occurrence, chosen independently from H, CH_3, and C_2H_5.

4,705,704

NOVEL AMINOFUNCTIONAL POLYSILOXANE EMULSIONS FOR TREATING TEXTILES

Kimberley J. Lane, Clifton Park, and Frank J. Traver, Troy, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 782,654, Oct. 1, 1985, Pat. No. 4,661,577. This application Jan. 12, 1987, Ser. No. 2,524

Int. Cl.[4] B05D *3/02*; C08L *83/00*

U.S. Cl. 427—389.9 35 Claims

1. An aqueous emulsion composition, comprising:

(a) a substantially trialkylsiloxy terminated polysiloxane having at least one amino or substituted amino group linked to at least one trifunctional siloxy unit of said polysiloxane through an alkylene bridge,

(b) an effective amount of emulsifying agent, and

(c) an effective amount of water.

4,705,705

PROCESS FOR THE PRODUCTION OF SLIDES WITH DELIMITED REACTION FIELDS, AND THE SLIDES PRODUCED BY THE PROCESS

Klaus Bross, Freiburg, Fed. Rep. of Germany, assignor to Paul Marienfeld KG, Fed. Rep. of Germany

Filed Apr. 18, 1986, Ser. No. 853,408

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515160

Int. Cl.[4] A47G *1/12*; G02B *21/34*

U.S. Cl. 428—13 17 Claims

1. Process for the production of slides with one or more reaction fields, which are bounded by a hydrophobic surface coating and which, for the fixation of the preparations to be examined, are coated with subtances having an affinity therefor, characterized in that

(a) the regions of at least one surface of the slide which correspond to the reaction fields to be formed are covered with a material which adheres to the surface and which is removable,

(b) the entire surface of the slide treated in this manner is coated with a hydrophobic material,

(c) the reaction fields are exposed by removal of the covering material, and

(d) the exposed reaction fields are coated with the substance having an affinity for the preparations to be examined.

17. A slide produced according to the process of claim 1 and comprising a hydrophobic surface coating containing exposed reaction field regions coated with a substance having an affinity for the preparations to be examined.

4,705,706

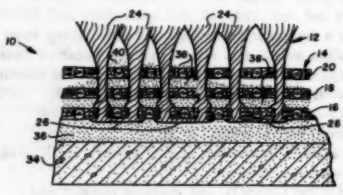
TUFTED CARPETING HAVING STITCHES THERMALLY BONDED TO BACKING

George S. Avery, Rome, Ga., assignor to AVCO Synthetic Turf Production Distribution, Inc., Rome, Ga.

Filed Sep. 16, 1986, Ser. No. 907,817

Int. Cl.[4] B32B *33/00*

U.S. Cl. 428—17 24 Claims



1. A process for preparing tufted carpeting, comprising:

(a) providing a backing having a front side and an underside, said backing comprising at least one layer;

(b) stitching a plurality of side-by-side rows of yarn through said backing so as to dispose back-loops of said yarn closely adjacent said underside of said backing and so as to dispose pile on the front side of said backing, which pile projects outwards from said front side of said backing; and

(c) applying energy to the thus-tufted backing, sufficient to thermally bond said back-loops of said yarn to said backing as at least the principal mode for bonding said yarn to said backing, said backing remaining substantially porous to sand upon completion of step (c).

4,705,707

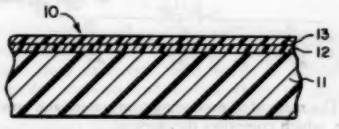
POLYETHYLENE/POLYESTER NONORIENTED HEAT SEALABLE MOISTURE BARRIER FILM AND BAG

John P. Winter, Appleton, Wis., assignor to Presto Products, Incorporated, Appleton, Wis.

Filed Dec. 17, 1985, Ser. No. 810,101

Int. Cl.[4] B65B *25/06*; B32B *27/08*

U.S. Cl. 428—35 44 Claims



1. A nonoriented, heat sealable, coextruded, moisture barrier film-comprising:

a base layer comprising polyethylene;

a heat sealant layer selected from the group consisting of a polyester, a copolyester and combinations thereof; and

a tie layer between the base layer and the heat sealant layer selected from the group consisting of a modified polyolefin blend, an unmodified polyethylene copolymer and combinations thereof.

42. A laminate bag comprising:

a nonoriented, heat sealable, coextruded, moisture barrier film comprising:

a base layer comprising polyethylene;

a heat sealant layer selected from the group consisting of a polyester, a copolyester and combinations thereof; and

a tie layer between the base layer and the heat sealant layer wherein the tie layer is selected from the group consisting of a modified polyethylene homopolymer, a modified polyethylene copolymer, an unmodified polyethylene copolymer and combinations thereof; and

a paper lamina having the nonoriented, heat sealable, coextruded, moisture barrier film adhesively laminated to the paper lamina to form a laminate sheet wherein the laminate sheet is formed into the laminate bag having a predetermined size.

4,705,708

MULTI-LAMINATE STRUCTURE CONTAINING A SCRAP LAYER AND CONTAINERS MADE THEREFROM

Jerald E. Briggs, St. Charles, Ill., and Henry Pfutzenreuter, Alta Loma, Calif., assignors to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 354,636, Mar. 4, 1982, abandoned. Filed Feb. 15, 1984, Ser. No. 579,291

Int. Cl.[4] B27N *5/02*

U.S. Cl. 428—35 23 Claims

1. A multi-layer plastic container adapted to contain oxygen sensitive products or contain products sensitive to permeation losses, formed by coextruding in a molten state a plurality of plastic layers to form a parison, forming said parison into a container by blow-molding, said container having a plurality of layers formed from said parison comprising an inner thermoplastic polyolefin layer which is next to the product; an

outer thermoplastic polyolefin layer; a barrier layer to prevent product oxidation or product permeation loss; a scrap layer including a mixture of a regrind of all the layers from previous containers of the same construction, said previous containers

comprising inner and outer thermoplastic polyolefin layers, a barrier layer, an adhesive layer and a scrap layer; and at least one adhesive layer to adhere said barrier layer to a least one of the other layers.

4,705,709

LUBRICANT COMPOSITION, METHOD OF COATING AND A COATED INTUBATION DEVICE

Vincent L. Vaillancourt, Livingston, N.J., assignor to Sherwood Medical Company, St. Louis, Mo.

Filed Sep. 25, 1985, Ser. No. 781,218
Int. Cl.[4] A61M *5/325, 25/005;* A01N *1/02*
U.S. Cl. 428—36 **22 Claims**

1. An intubation device having a body and a coating on at least a portion of said body, said coating including an effective amount of a hydrophilic polymer and a compound selected from the group consisting of nonionic and amphoteric surfactants, said compound being present in an amount effective to reduce the coefficient of friction of said coating to less than about 0.6 upon contact with water in less than about 5 minutes.

4,705,710

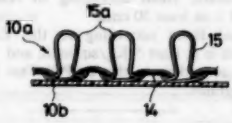
BIDIRECTIONALLY STRETCHABLE SUPPORT TAPE FOR HOOK-AND-LOOP FASTENERS

Yoshio Matsuda, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Dec. 30, 1986, Ser. No. 947,647
Claims priority, application Japan, Dec. 30, 1985, 60-203271[U]
Int. Cl.[4] B32B *33/00*
U.S. Cl. 428—92 **7 Claims**

1. A support tape for hook-and-loop fasteners, comprising:

(a) a bidirectionally stretchable weft-knit web having a plain stitch construction formed of an elastic foundation yarn and a non-elastic pile yarn concurrently looped together; and



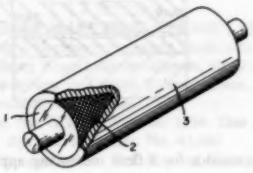
(b) a layer of an elastic material coated on the underside of said weft-knit web.

4,705,711

POLYIMIDE COVERED CALENDER ROLLS

Dominic R. Perna, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 30, 1986, Ser. No. 811,715
Int. Cl.[4] B32B *3/00, 15/08, 27/06*
U.S. Cl. 428—141 **1 Claim**



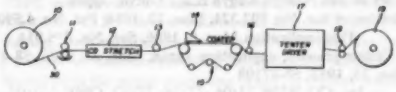
1. In a cylindrical metal shaft bearing a polyimide cover, the improvement wherein the shaft is knurled with a diamond or straight pattern to a depth of about from 0.001 to 0.005 inches, wherein the product of the knurl diametral pitch and the depth of knurl on the shaft in inches is about from 0.15 to 0.32, and the interference between the polyimide cover and the shaft is about from 0.003 to 0.0085 inches per inch of shaft diameter.

4,705,712

OPERATING ROOM GOWN AND DRAPE FABRIC WITH IMPROVED REPELLENT PROPERTIES

Alan G. Cashaw; Robert Cole, both of North Brunswick; Rory Holmes, Princeton; Herbert L. Whitaker, Jr., Lebanon, all of N.J., and Lauren Jackson, San Clemente, Calif., assignors to Chicopee Corporation, New Brunswick, N.J.

Filed Aug. 11, 1986, Ser. No. 895,568
Int. Cl.[4] B32B *5/06*
U.S. Cl. 428—152 **21 Claims**



1. A repellent, breathable non-woven fabric, said fabric comprising rudimentary discontinuous rows of entangled cellulosic fibers alternating with rudimentary discontinuous rows of loosely entangled polymeric fibers, said rows extending in the machine directio and said fabric having one surface comprising predominantly entangled cellulosic fibers and an opposite surface comprising predominantly entangled polymeric fibers, said fabric having been repellent treated and coated with fine fibers on said one surface, at least 70% by weight of said fine fibers being capable of passing through a 200 mesh screen, there being between 0.5% and 10% by weight of said

fiber coating based upon the total weight of said treated fabric; said fabric possessing the following properties:

the Hydrostatic Head according to AATCC Test No. 127-1974 is at least 30 cms;

the Internal Bond according to the TAPPI Test No. J506SU68 is at least 5 Kg/sq. inch; and

the Hand, according to the TAPPI Test No. T498 is less than 50 grams.

4,705,713

FILM RESISTOR FOR FLOW MEASURING APPARATUS

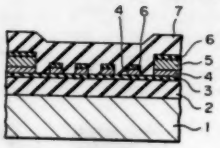
Minoru Ohta, Okazaki; Kazuhiko Miura, Nukata; Michitoshi Onoda, Toyohashi; Yukio Iwasaki, Gifu, and Tadashi Hattori, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 11, 1986, Ser. No. 828,451

Claims priority, application Japan, Feb. 16, 1985, 60-27545

Int. Cl.[4] B05D *1/00;* **H01L** *29/04*

U.S. Cl. 428—209 **7 Claims**



1. A film resistor for a flow measuring apparatus, comprising:

a substrate;

a first insulating layer formed on said substrate;

a first titanium dioxide (TiO_2) layer formed on said first insulating layer;

a platinum (Pt) pattern formed on said first titanium dioxide layer;

a second titanium dioxide (TiO_2) layer formed on said platinum pattern; and

a second insulating layer formed on said second titanium dioxide layer,

said first and second titanium dioxide layers respectively improving bonding strength of said platinum pattern to said first insulating layer and to said second insulating layer in comparison with an otherwise identical film resistor from which said first and second titanium dioxide layers are omitted.

4,705,714

DIFFERENTIALLY CROSSLINKED AND ORIENTED POLYETHYLENE FILM

Yasushi Itaba, Tokyo; Keichiro Saito; Jyoichi Tabuchi, both of Saitama, and Masao Yoshizawa, Tokyo, all of Japan, assignors to Toa Nenryo Kogyo K.K., Tokyo, Japan

Division of Ser. No. 592,321, Mar. 22, 1984, Pat. No. 4,590,020. This application Mar. 6, 1986, Ser. No. 836,914

Claims priority, application Japan, Mar. 23, 1983, 58-47107; Mar. 23, 1983, 58-47108

Int. Cl.[4] B32B *27/06, 27/16, 27/32;* **C08F** *110/02*

U.S. Cl. 428—215 **9 Claims**

1. An oriented polyethylene film comprising:

(a) outer surface layers of polyethylene selected from HDPE and blends of HDPE and a small quantity of at least one other polyolefin crosslinked to have a gel fraction of between 20 and 70%; and

(b) a middle layer of polyethylene selected from HDPE and blends of HDPE and a small quantity of at least one other polyolefin having a gel fraction of between 0 and 5%;

wherein said film has a haze of less than 5%, a density greater than 0.940 g/cm^3 and a thickness ratio of said outer layer: middle layer: outer layer of between 10:1:10 to 1:10:1, and wherein said film has been heat oriented stretched by at least 300%.

4,705,715

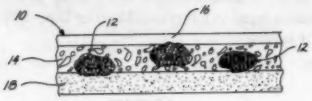
ADHESIVE TAPES HAVING A FOAMED BACKING AND METHOD FOR MAKING SAME

Leonard D. DeCoste, Jr., Stoneham, and Abboud L. Mamish, Natick, both of Mass., assignors to The Kendall Company, Boston, Mass.

Filed Oct. 28, 1986, Ser. No. 923,939

Int. Cl.[4] B32B *3/26, 5/14, 5/18*

U.S. Cl. 428—246 **13 Claims**



1. In adhesive tape comprising an adhesive coated onto a backing comprising a cloth material and a layer of plastic,

the improvement wherein said plastic comprises a foam having a thin plastic skin adhered to the outer surface thereof.

4,705,716

INTEGRAL CAR BODY MADE OF COMPOSITE MATERIAL

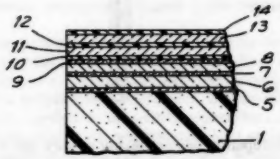
Jinsheng Tang, Zhonghua Automobile Manufacturing Corporation, Shenzhen, Guangdong Province, China

Filed Apr. 1, 1986, Ser. No. 846,864

Claims priority, application China, Apr. 1, 1985, 85200688

Int. Cl.[4] B32B *3/26, 5/18, 17/04*

U.S. Cl. 428—251 **11 Claims**



1. An integral car body wherein the body is made of high strength lightweight composite material, said composite material being made by using at least one layer of glass fiber cloth soaked with epoxy resin and at least two layers of glass fiber cloth soaked with polyester to successively wrap an inner mold made of composite foam material fully with overlap.

4,705,717

TENT LINERS/WALLS FOR COLD WEATHER OPERATIONS

J. Bradley Cain, Almonte, Canada, and Brian Farnworth, Soest, Netherlands, assignors to Her Majesty the Queen in right of Canada, Canada

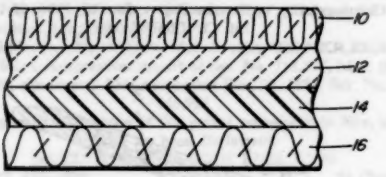
Filed Mar. 12, 1986, Ser. No. 838,809

Int. Cl.[4] B32B *7/00*

U.S. Cl. 428—252 **11 Claims**

1. A composite material comprising:

an outermost water-vapour permeable, substantially windproof layer;
a thermal insulating layer adjacent the outermost layer;



a single water-vapour barrier layer adhesively bonded to the thermal insulating layer; and
an innermost water-absorbent layer.

4,705,718

MAGNETIC RECORDING MEDIUM

Shinichi Kitahata, and Mikio Kishimoto, both of Osaka, Japan; assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Nov. 27, 1985, Ser. No. 802,386
Claims priority, application Japan, Nov. 30, 1984, 59-254313
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—323 **14 Claims**

1. A magnetic recording medium suitable for high density recording comprising:
a substrate and
a magnetic layer which comprises (1) a binder resin and (2) ferrite magnetic powder dispersed in said binder resin comprising hexagonal system plate particles having a coercive force of 200 to 2,000 oersted, a size of 0.02 to 0.5 μm and such a magnetic anisotraophy that a magnetic anistrophy constant K_1, corresponding to the vertical magnetic component, and a magnetic anisotropy constant K_2, corresponding to the horizontal magnetic component, both being derived from Fourier analysis of a magnetic torque curve measured in a plane including the C axis of the hexagonal system, satisfy the following equations:

$$0.5<K_1/K_2<5 \text{ and } K_1>0,$$

and wherein said hexagonal system plate particles constitute at least 95% by weight of the total weight of said magnetic powder in said magnetic layer.

4,705,719

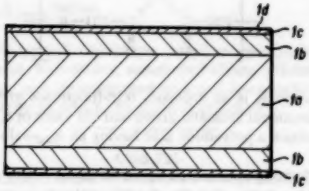
SYNTHETIC PAPER OF MULTILAYER RESIN FILMS

Masaaki Yamanaka; Masayuki Inoue, and Harumitsu Asazuma, all of Ibaraki, Japan, assignors to Oji Yuka Goseishi Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 868,054, May 29, 1986, abandoned. This application Jun. 5, 1986, Ser. No. 870,951
Claims priority, application Japan, Jun. 5, 1985, 60-121897; Apr. 23, 1986, 61-93554
Int. Cl.[4] B32B *5/16, 27/00*
U.S. Cl. 428—323 **4 Claims**

1. Synthetic paper of multilayer resin films comprising a base layer (1*a*) constituted by a biaxially stretched film made of the thermoplastic resin, and a laminate provided onto at least one of opposite surfaces of said base layer, said laminate including a paper-like layer (1*b*) and a surface layer (1*c*), said paper-like layer being constituted by a uniaxially stretched film made of a thermoplastic resin containing 8 to 65% by weight of inorganic fine powder, said surface layer being constituted by a uniaxially stretched film made of a thermoplastic resin, said surface layer having a thickness t satisfying the following expression

$$R \geqq t \geqq (1/10) \times R$$



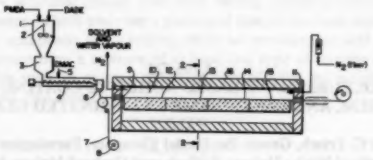
in which R represents an average particle diameter of said inorganic fine powder existing in the paper-like layer.

4,705,720

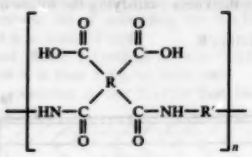
FLEXIBLE MULTI-LAYER POLYIMIDE LAMINATES

Ernst F. Kundinger, Breuberg/Neustadt; Erich Klimesch, Erlenbach; Hans-Georg Zengel, Kleinwallstadt, all of Fed. Rep. of Germany, and Jeffery D. Lasher, Tolland, Conn., assignors to Akzo NV, Arnhem, Netherlands

Division of Ser. No. 832,582, Feb. 24, 1986. This application Apr. 22, 1987, Ser. No. 41,088
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1985, 3506524
Int. Cl.[4] B32B *15/00*; B05D *3/02*
U.S. Cl. 428—332 **19 Claims**



1. A flexible multilayer laminate comprising
(a) at least one layer of a substrate material, said substrate layer having at least a first side and a second side;
(b) at least one first layer of no longer formable, fully aromatic polyimide having a first side directly joined to said first side of said substrate layer with a peel strength of at least 4.0N/cm, said first polyimide layer being insoluble in phenolic solvents, having a tensile strength of from 100 to 150N/mm^2, having a breaking elongation of from 15 to 100% and having a dielectric dissipation factor of from 1.5×10^{-3} to 5×10^{-3} at 1 KHz, said first polyimide layer having a second side remote from said substrate layer; and
(c) a layer of heat-sealable high-temperature adhesive selected from the group consisting of polyacrylates, polysulfone resins, epoxy resins, fluoropolymer resins, silicone resins and butyl rubbers, said adhesive layer being joined to said second side of said first polyimide layer;
said laminate being produced by the process comprising:
(1) applying a polyamide acid solution to a first side of a substrate layer without a coupling layer to form a coated substrate layer, said polyamide acid solution being formed by reacting an aromatic tetracarboxylic acid or its dianhydride with a primary aromatic diamine in a molar ratio of from 0.95:1 to 1.05:1 in a polar solvent, to form a solution of a polyamide acid corresponding to the following formula:



wherein R is an aromatic tetrafunctional group, R' is a difunctional aromatic group and the value of n is sufficient to obtain a polyamide acid having an η_{red}-value of at least 0.5;

(2) heating said coated substrate layer;

(3) removing virtually all of the solvent in situ from said polyamide acid solution on said substrate layer in a first stage to form a film, said first stage being carried out at a temperature of from 100° to 200° C.;

(4) hardening the film in situ in a second stage, said second stage being carried out at a temperature above 200° C. to give a no longer formable polyimide layer which is insoluble in phenolic solvents, and wherein at least 95% of said polyamide acid is reacted to a polyimide; and

(5) applying to said polyimide layer a heat-sealable high-temperature adhesive selected from the group consisting of polyacrylates, polysulfone resins, epoxy resins, fluoropolymer resins, silicone resins and butyl rubbers to produce a basic element.

4,705,721

POLYURETHANE-BASED ADHESIVE COATING OR FILM, AND USE OF SAME IN LAMINATED GLASS PANES

Kurt C. Frisch, Grosse Ile; Daniel Klempner, Farmington Hills, both of Mich.; Helmer Rädisch, and Gerhard Holzer, both of Aachen, Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Feb. 26, 1986, Ser. No. 833,044

Claims priority, application France, Feb. 26, 1985, 85 02740

Int. Cl.[4] B32B *27/08, 17/10, 27/40*

U.S. Cl. 428—349 **12 Claims**

1. A transparent adhesive polyurethane-based layer for use in laminated panes, wherein the polyurethane is formed from at least one aliphatic or cycloaliphatic diisocyanate, at least one polyol selected from the group consisting of the polyether diols, the polycaprolactone diols, the polycarbonate diols, and the polybutadiene diols, and at least one chain-lengthening agent which is a product of the reduction of dimeric acid to diol form, said dimeric acid having 36 C atoms and produced by Diels-Alder-type dimerization of unsaturated fatty acids having 18 C atoms, said acid being further characterized by having two or more lateral alkyl branches and at least one olefinic double bond.

2. A transparent sheet of plastic material of high optical quality, employed in the manufacture of laminated glass panes and comprised of two layers, one of which layers is comprised of plastic material having antilaceration and self-healing properties, wherein the first layer is comprised of a heat-setting polyurethane material, and the other layer comprised of plastic material having adhesive properties; and wherein the layer of plastic material having adhesive properties is the adhesive layer according to claim **1**.

4,705,722

GLAND PACKING

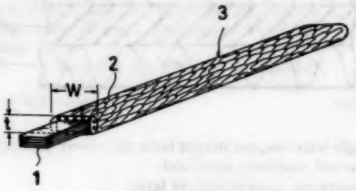
Takahisa Ueda, Sanda, and Tomikazu Shiomi, Kobe, both of Japan, assignors to Nippon Pillar Packing Co., Ltd., Japan

Filed Nov. 26, 1986, Ser. No. 935,495

Claims priority, application Japan, Jun. 18, 1986, 61-142078

Int. Cl.[4] D06P *7/00*

U.S. Cl. 428—365 **14 Claims**



1. A gland packing comprising a plurality of flexible graphite sheets cut to a width of less than 5 mm and laid in superposed relation to one another, the laid-up graphite sheets having their surface covered with a fiber material by knitting or braiding to form a knitting thread, said knitting thread being twisted.

4,705,723

PROCESS FOR USING RICINOLEATE PLASTICIZED POLYURETHANES FOR SEALING ELECTRICAL DEVICES

Melvin Brauer, East Brunswick; William J. Downey, Linden, and Frank C. Naughton, Mountainside, all of N.J., assignors to CasChem, Inc., Bayonne, N.J.

Division of Ser. No. 837,555, Mar. 3, 1986, Pat. No. 4,666,969, which is a continuation-in-part of Ser. No. 713,379, Mar. 19, 1985, abandoned. This application Dec. 24, 1986, Ser. No. 945,986

Int. Cl.[4] B32B *27/64, 27/06, 27/22, 27/40*

U.S. Cl. 428—375 **22 Claims**

1. A process for providing a fluid impervious protective seal around an insulated electrical device which comprises introducing the components of a polyurethane gel composition comprising about 10 to 90 parts by weight of the liquid reaction product of an organic polyisocyanate and a polyol in the presence of about 90 to 10 parts by weight of a ricinoleate plasticizer compound having a total solubility parameter of between about 8.3 and 8.9 or between about 9.1 and 9.7 into a confined space surrounding the section of a device to be protected and allowing said composition to cure to a gel.

17. An insulated electrical device comprising a plurality of insulated wire conductors and a cured polyurethane gel composition comprising about 10 to 90 parts by weight of the liquid reaction product of an organic polyisocyanate and a polyol in the presence of about 90 to 10 parts by weight of a ricinoleate plasticizer compound having a total solubility parameter of between about 8.3 and 8.9 or between about 9.1 and 9.7.

4,705,724

PROCESS FOR USING ESTER PLASTICIZED POLYURETHANES FOR SEALING ELECTRICAL DEVICES

William J. Downey, Linden; Melvin Brauer, East Brunswick, and Jerry Chien-I Chao, Bayonne, all of N.J., assignors to CasChem, Inc., Bayonne, N.J.

Division of Ser. No. 837,554, Mar. 3, 1986, Pat. No. 4,666,968, which is a continuation-in-part of Ser. No. 713,377, Mar. 19, 1985, abandoned. This application Dec. 24, 1986, Ser. No. 945,981

The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.

Int. Cl.[4] B32B *27/04, 27/06, 27/22, 27/40*

U.S. Cl. 428—375 22 Claims

1. A process for providing a fluid impervious protective seal around an insulated electrical device which comprises introducing the components of a polyurethane gel composition comprising about 10 to 90 parts by weight of the liquid reaction product of an organic polyisocyanate and a polyol having an equivalent weight above 250 in the presence of about 90 to 10 parts by weight of an ester plasticizer compound having a total solubility parameter of between about 8.3 and 8.9 or between about 9.1 and 9.7 into a confined space surrounding the section of a device to be protected and allowing said composition to cure to a gel.

17. An insulated electrical device comprising a plurality of insulated wire conductors and a cured polyurethane gel composition comprising about 10 to 90 parts by weight of the liquid reaction product of an organic polyiscyanate and a polyol having an equivalent weight above 250 in the presence of about 90 to 10 parts by weight of an ester plasticizer compound having a total solubility parameter of between about 8.3 and 8.9 or between about 9.1 and 9.7.

4,705,725

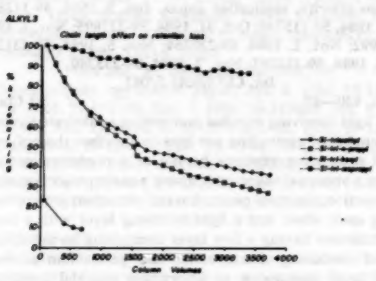
SUBSTRATES WITH STERICALLY-PROTECTED, STABLE, COVALENTLY-BONDED ORGANO-SILANE FILMS

Joseph L. Glajch, and Joseph J. Kirkland, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

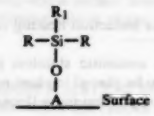
Filed Nov. 28, 1986, Ser. No. 936,084

Int. Cl.[4] B32B *9/00;* B01D *15/08;* B01J *20/10*

U.S. Cl. 428—405 17 Claims



1. A stable support structure comprising a substrate and a monofunctional silane, containing two sterically-protecting groups, R, and an additional functional group, R_1, covalently attached to the substrate, the silane being as follows:



where R=isopropyl, t-butyl, sec.-butyl, sec. pentyl, isopentyl, or cyclohexyl, R_1=alkane, substituted alkane, alkene, substituted alkene, aryl, or substituted aryl; and A=a surface group of the substrate to which the silane is attached.

4,705,726

ANTICORROSIVE WELDABLE COATED STEEL

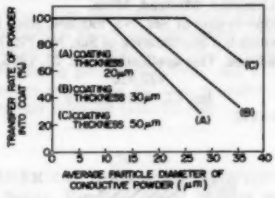
Yoshio Shindou; Joji Oka; Taketoshi Tairs; Yujiro Miyauchi, and Fumio Yamazaki, all of Kimitsu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Feb. 2, 1987, Ser. No. 10,074

Claims priority, application Japan, Mar. 12, 1986, 61-52397

Int. Cl.[4] B22F *7/04*

U.S. Cl. 428—562 8 Claims



1. A weldable coated steel plate having excellent corrosion resistance, which plate has a plating of zinc, a zinc base alloy or a zinc composite and a coating material provided on said plating, comprising a mixture of at least one type of ferrous alloy powder with an oxygen concentration of 1.0% by weight or less and zinc dust.

4,705,727

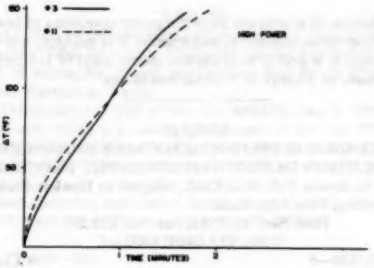
COMPOSITE MATERIAL FOR INDUCTION HEATING

James R. Hunter, McMurray, Pa., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 11, 1985, Ser. No. 786,423

Int. Cl.[4] B32B *15/10, 15/00*

U.S. Cl. 428—653 12 Claims



1. A composite material suitable for induction heating comprising:

(a) a layer of magnetic, ferritic stainless steel of a thickness of up to about 0.005 inches; and

(b) on each side of said magnetic layer, a layer of non-mag-

netic, austenitic stainless steel of a thickness up to about 0.005 inches.

4. A composite material suitable for induction heating comprising:

(a) a first layer of non-magnetic austenitic stainless steel having two faces and designed to be placed in close proximity to a magnetic induction coil and having a thickness of up to 0.005 inches,

(b) a second layer of magnetic, ferritic stainless' steel bonded to the face of said first layer farthest from said induction coil and having a thickness of up to 0.005 inches;

(c) a third layer of non-magnetic, austenitic stainless steel bonded to said second layer and having a thickness of up to 0.005 inches;

(d) a fourth layer of aluminum bonded to said third layer and having a thickness of up to 0.200 inches; and

(e) a fifth layer of non-magnetic, austenitic stainless steel bonded to said fourth layer.

4,705,728

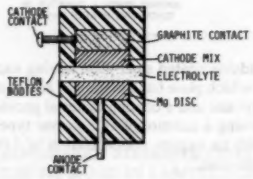
SOLID POLYMER ELECTROLYTE AND PRODUCTION METHOD

Thomas D. Gregory, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 895,094, Aug. 11, 1986, abandoned, which is a continuation of Ser. No. 799,700, Nov. 19, 1985, abandoned. This application Oct. 27, 1986, Ser. No. 922,920

Int. Cl.[4] H01M *6/18*

U.S. Cl. 429—192 **6 Claims**



1. An anionically conductive solid polymer and salt complex electrolyte, solid at a temperature of about 20° C. to about 100° C., wherein said polymer and salt electrolyte comprise:

A. at least one polymer derived from at least one monomer comprising at least one heteroatom in the monomer unit and

B. at least one ionizing salt comprising a salt of the formula:

$$(R)_3CMX_n$$

wherein M is selected from the group consisting of boron, phosphorus, antimony, and arsenic, X is halogen, n is 4 to 6, and R is aryl of 6–18 carbon atoms, alkyl of 1–8 carbon atoms, or alkaryl of 7–26 carbon atoms.

4,705,729

METHOD FOR PHOTOCHEMICALLY ENHANCING RESOLUTION IN PHOTOLITHOGRAPHY PROCESSES

James R. Sheats, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 19, 1984, Ser. No. 673,243

Int. Cl.[4] G03F *9/00*

U.S. Cl. 430—5 **4 Claims**

1. A method of processing integrated ciruits comprising the steps of:

depositing a first layer of photoresistive material on a substrate;

depositing a second layer containing a mixture of a polymer and a dye upon said first layer, said dye having a nonlinear photobleaching response to the intensity of an incident fluence;

irradiating said second layer with a preselected pattern to convert said second layer to an optical mask of said preselected pattern without substantially effecting said first layer; and

illuminating said second layer to transfer said preselected pattern to said first layer without substantially further effecting said second layer.

4,705,730

LIGHT-RECEIVING MEMBER

Keishi Saitoh, Ibaraki; Tetsuo Sueda, Chofu; Kyosuke Ogawa, Tokyo; Teruo Misumi, Kawasaki; Yoshio Tsuezuki, Toride, and Masahiro Kanai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1985, Ser. No. 739,867

Claims priority, application Japan, Jun. 4, 1984, 59-113175

Int. Cl.[4] G03G *5/085*

U.S. Cl. 430—57 **29 Claims**

1. A light-receiving member which comprises a substrate having a large number of projection parts, whose cross-sectional shape at a given cross-sectional position is a projection shape formed of a main peak and an auxiliary peak as overlapped, on the surface of the substrate, and a light-receiving layer comprising a layer containing an amorphous material including silicon atoms, at least one part of the layer region of the layer being photosensitive, and a surface layer having a reflection-preventive function.

4,705,731

MEMBER HAVING SUBSTRATE WITH PROTRUDING SURFACE LIGHT RECEIVING LAYER OF AMORPHOUS SILICON AND SURFACE REFLECTIVE LAYER

Keishi Saitoh, Ibaraki; Tetsuo Sueda, Chofu; Kyosuke Ogawa, Tokyo; Teruo Misumi, Kawasaki; Yoshio Tsuezuki, Toride, and Masahiro Kanai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 3, 1985, Ser. No. 740,901

Claims priority, application Japan, Jun. 5, 1984, 59-113850; Jun. 6, 1984, 59-115748; Oct. 31, 1984, 59-227895; Nov. 1, 1984, 59-228992; Nov. 2, 1984, 59-230354; Nov. 5, 1984, 59-231244; Nov. 6, 1984, 59-232357; Nov. 7, 1984, 59-233280

Int. Cl.[4] G03G *5/085*

U.S. Cl. 430—57 **63 Claims**

1. A light-receiving member comprising a substrate having a large number of protruding portions on a surface thereof, each of said protruding portions having at a predetermined cut position a sectional shape comprising a main projection and a subprojection, the main projection and the subprojection overlapping each other, and a light-receiving layer with a multilayer structure having a first layer comprising an amorphous material containing silicon atoms and germanium atoms, a second layer comprising an amorphous material containing silicon atoms and exhibiting photoconductivity, and a surface layer having the reflection preventive function provided successively from the substrate side, said light-receiving layer containing at least one selected from oxygen atoms, carbon atoms and nitrogen atoms.

4,705,732

MEMBER HAVING SUBSTRATE WITH PROJECTING PORTIONS AT SURFACE AND LIGHT RECEIVING LAYER OF AMORPHOUS SILICON

Keishi Saitoh, Ibaraki; Masahiro Kanai, Tokyo; Tetsuo Sueda, Chofu; Teruo Misumi, Kawasaki; Yoshio Tsuezuki, Toride, and Kyosuke Ogawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1985, Ser. No. 726,768

Claims priority, application Japan, Apr. 27, 1984, 59-86591; Apr. 28, 1984, 59-86895; Apr. 29, 1984, 59-87269; Apr. 30, 1984, 59-87228; May 1, 1984, 59-88028; May 2, 1984, 59-88688; Oct. 30, 1984, 59-226663; Oct. 31, 1984, 59-227894; Nov. 1, 1984, 59-228991; Nov. 2, 1984, 59-230353; Nov. 5, 1984, 59-231243; Nov. 6, 1984, 59-232356

Int. Cl.[4] G03G *5/085*

U.S. Cl. 430—57 50 Claims

1. A light-receiving member comprising a substrate having a large number of protruding portions on a surface thereof, each of said protruding portions having at a predetermined cut position a sectional shape comprising a mainprojection and a subprojection, the main projection and the subprojection overlapping each other, and a light-receiving layer of a multi-layer structure having a first layer comprising an amorphous material containing silicon atoms and germanium atoms and a second layer comprising an amorphous material containing silicon atoms and exhibiting photoconductivity provided on said substrate successively from the substrate side.

4,705,733

MEMBER HAVING LIGHT RECEIVING LAYER AND SUBSTRATE WITH OVERLAPPING SUBPROJECTIONS

Keishi Saitoh, Ibaraki; Masahiro Kanai, Tokyo; Tetsuo Sueda, Chofu; Teruo Misumi, Kawasaki; Yoshio Tsuezuki, Toride, and Kyosuke Ogawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1985, Ser. No. 725,751

Claims priority, application Japan, Apr. 24, 1984, 59-82606; Apr. 25, 1984, 59-83284; Apr. 26, 1984, 59-84703

Int. Cl.[4] G03G *5/085*

U.S. Cl. 430—57 64 Claims

1. A substrate for light-receiving members, having a large number of protruding portions on a surface thereof, each of said protruding portions having at a predetermined cut position a sectional shape comprising a main projection and a subprojection, the main projection and the subprojection overlapping each other.

4,705,734

MEMBER HAVING SUBSTRATE WITH IRREGULAR SURFACE AND LIGHT RECEIVING LAYER OF AMORPHOUS SILICON

Keishi Saitoh, Ibaraki; Tetsuo Sueda, Chofu; Kyosuke Ogawa, Tokyo; Teruo Misumi, Kawasaki; Yoshio Tsuezuki, Toride, and Masahiro Kanai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1985, Ser. No. 740,714

Claims priority, application Japan, Jun. 5, 1984, 59-113851; Jun. 6, 1984, 59-115749; Jun. 7, 1984, 59-115604; Jun. 9, 1984, 59-117459; Jun. 11, 1984, 59-118097; Jun. 12, 1984, 59-119092; Jun. 13, 1984, 59-119750; Jun. 15, 1984, 59-122071; Jun. 18, 1984, 59-123855; Nov. 1, 1984, 59-228993; Nov. 2, 1984, 59-230356; Nov. 5, 1984, 59-231245; Nov. 6, 1984, 59-232358; Nov. 7, 1984, 59-233281; Nov. 8, 1984, 59-234112

Int. Cl.[4] G03G *5/085*

U.S. Cl. 430—57 81 Claims

1. A light-receiving member comprising a substrate having a large number of protruding portions on a surface thereof, each of said protruding portions having at a predetermined cut position a sectional shape comprising a main projection and a subprojection, the main projection and the subprojection overlapping each other, and a light-receiving layer comprising a layer comprising an amorphous material containing silicon atoms, at least a part of the layer region of which has photosensitivity and a surface layer comprising an amorphous material containing silicon atoms and carbon atoms.

4,705,735

MEMBER HAVING SUBSTRATE WITH PROTRUDING SURFACE PORTIONS AND LIGHT RECEIVING LAYER WITH AMORPHOUS SILICON MATRIX

Keishi Saitoh, Ibaraki; Tetsuo Sueda, Chofu; Kyosuke Ogawa, Tokyo; Teruo Misumi, Kawasaki; Yoshio Tsuezuki, Toride, and Masahiro Kanai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1985, Ser. No. 741,300

Claims priority, application Japan, Jun. 7, 1984, 59-115603; Jun. 8, 1984, 59-116628; Jun. 11, 1984, 59-118096; Jun. 12, 1984, 59-119091; Jun. 13, 1984, 59-119749; Jun. 14, 1984, 59-120839

Int. Cl.[4] G03G *5/085*

U.S. Cl. 430—57 38 Claims

1. A light-receiving member comprising a substrate having a large number of protruding portions on a surface thereof, each of said protruding portions having at a predetermined cut position a sectional shape comprising a main projection and a subprojection, the main projection and the subprojection overlapping each other, and a light-receiving layer of a multi-layer structure having a first layer comprising an amorphous material containing silicon atoms and germanium atoms, a second layer comprising an amorphous material containing silicon atoms and exhibiting photoconductivity and a surface layer having reflection preventive function provided on the substrate successively from the substrate side.

4,705,736

THERMAL DIAZO COMPOSITION

Norman T. Notley, Pasadena, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 5, 1985, Ser. No. 805,954

Int. Cl.[4] G03C *1/60, 1/52, 1/58*

U.S. Cl. 430—138 13 Claims

1. A diazotype sheet developable solely by heat, the sheet comprising in at least one layer a heat-softenable, organic solvent-soluble resin, an acid-stabilized diazonium salt, at least one azo-coupler compound capable of reacting to form a dye, and an acid neutralizing component immobilized either by encapsulation or by coating as a separate layer with or without a binder, and having incorporated in at least one layer of said diazotype sheet at least one plasticizer compatible with said resin, said plasticizer consisting essentially of a compound which is either liquid at room temperature or fusible at a temperature between room temperature and the development temperature, wherein said diazotype sheet is shelf stable for at least 8 months at temperatures as high as 24° C.

4,705,737

HEAT DEVELOPABLE PHOTOGRAPHIC MATERIALS

Hiroyuki Hirai; Kozo Sato; Yoshiharu Yabuki, and Ken Kawata, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 688,651, Jan. 3, 1985, abandoned, which is a continuation-in-part of Ser. No. 590,388, Mar. 16, 1984, abandoned, and a continuation-in-part of Ser. No. 732,323, May 9, 1985, abandoned. This application Aug. 20, 1985, Ser. No. 767,405

Claims priority, application Japan, Mar. 16, 1983, 58-43861; May 9, 1984, 59-92558; Aug. 20, 1984, 59-172956

Int. Cl.[4] G03C *5/54, 1/40*

U.S. Cl. 430—203 20 Claims

1. A heat developable photographic material comprising a support having thereon at least a photo sensitive silver halide, a binder, a dye-providing material which releases or produces a hydrophilic mobile dye corresponding to or reversely corresponding to a reduction reaction of the photosensitive silver halide by heating, and at least one base precursor selected from

the group consisting of compounds represented by following formula (I):

$$[R\text{-}(\text{-}SO_2CH_2COOH)_x]_z\text{-}By \quad (I)$$

wherein R represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkylene group, a substituted or unsubstituted aryl group, a substituted or unsubstituted arylene group, a substituted or unsubstituted monovalent or divalent heterocyclic group; B represents a mono- or di-acidic nitrogen-containing, sulfur-free base having a pKa of not lower than 7 and containing 12 carbon atoms or less; x is an integer of 1 when R represents a monovalent group or an integer of 2 when R represents a divalent group, y is the same as x when B represents the mono-acidic base or an integer of 1 when B represents the di-acidic base; and z is an integer of 2 when R represents a monovalent group and B represents the di-acidic base or otherwise an integer of 1; whereby stability with the passage of time prior to heat development is improved.

17. The photographic material of claim 1, wherein the photographic material further comprises an image fixing layer provided on a support other than that for the light-sensitive layer, and said base precursor is incorporated in the image fixing layer.

4,705,738

SILVER HALIDE PHOTOGRAPHIC MATERIAL FOR TANNING DEVELOPMENT AND PROCESS OF PRODUCING A RELIEF IMAGE

Luciano Balestra, Savona, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 11, 1986, Ser. No. 838,368

Claims priority, application Italy, Mar. 18, 1985, 19945 A/85

Int. Cl.[4] G03C *1/06, 7/10*

U.S. Cl. 430—264 **12 Claims**

1. A process of producing a relief image on a silver halide photographic element for tanning development, which process comprises image-wise exposing said element, developing the exposed element in an alkali activating bath, and thereafter washing off the unhardened areas of the image with water, said photographic element comprising a support base coated with a substantially unhardened gelatin hydrophilic binder layer comprising a light-sensitive silver halide emulsion reactively associated with a tanning developer and a dispersion of collodial silver, characterized in that the pAg of the colloidal silver dispersion has been corrected before coating after washing to a value on the range from 6.5 to 9.5 with a 1-phenyl-5-mercaptotetrazole compound in an amount sufficient to prevent an undesirable hardening of the unhardened gelatin hydrophilic binder over time due to a mutual effect or artisan between the colloidal silver and the unhardened gelatin hydrophilic binder.

4,705,739

GRAPHIC ARTS IMAGING CONSTRUCTIONS USING VAPOR-DEPOSITED COLORANT AND METALLOID LAYERS WITH OVERLYING PHOTOSENSITIVE RESIST LAYER

Richard S. Fisch, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 631,532, Jul. 16, 1984, abandoned. This application Apr. 24, 1986, Ser. No. 856,046

The portion of the term of this patent subsequent to Jul. 8, 2003, has been disclaimed.

Int. Cl.[4] G03C *1/74, 1/94*

U.S. Cl. 430—276 **15 Claims**

1. A radiation-sensitive, imageable article comprising in sequence:

a substrate

a vapor-deposited colorant layer consisting of a colorant providing a reflection optical density of at least 0.6 to a 10 nm band of the electromagnetic spectrum between 280 and 900 nm,

at least one vapor-deposited metal, combination of metals, or metalloid layer of uniform composition coated directly over said colorant layer, and

a photosensitive resist layer which is non-integral with said colorant layer, the ratio of the thickness of said colorant layer/said metal or metalloid layer being at least 7:1, and the layers being located so as to prevent any intermixing of said colorant and photoresist layers, and said article being capable of providing a colored image through a metallic background.

15. A radiation-sensitive, imageable article comprising in sequence:

a substrate,

a vapor-deposited colorant layer consisting of a colorant capable of providing a reflection optical density of at least 0.6 to a 10 nm band of the electro-magnetic spectrum between 280 and 900 nm,

an organic protective layer, at least one vapor-deposited metal, combination

of metals, or metalloid layer of uniform composition, and

a photosensitive resist layer which is non-integral with said colorant layer, the ratio of the thickness of said colorant layer/metal layer being at least 7:1, and the layers being located so as to prevent any intermixing of said colorant and photoresist layers, and said article being capable of providing a colored image through a metallic background.

4,705,740

RADIATION-POLYMERIZABLE MIXTURE, COPOLYMER CONTAINED THEREIN, AND A PROCESS FOR THE PREPARATION OF THE COPOLYMER

Ulrich Geissler, Hochheim/Main, and Klaus Albrecht, Mainz, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 11, 1985, Ser. No. 753,945

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1984, 3427519

Int. Cl.[4] G03C *1/68;* C08F *20/06*

U.S. Cl. 430—288 **17 Claims**

1. A radiation-polymerizable mixture suitable for producing a transferable, dry photoresist film, comprising

(a) 30 to 70% by weight of a first compound capable of undergoing free radical polymerization, said first compound containing at least two terminal ethylenically unsaturated groups and having a boiling point above 100° C. under atmospheric pressure,

(b) 0.01 to 10% by weight of a second compound capable of initiating said polymerization of said first compound when exposed to actinic radiation, and

(c) 20 to 70% by weight of a water-insoluble copolymer which is soluble in aqueous alkaline solutions and which comprises

(c1) 20 to 60 mole-% of acrylic acid or methacrylic acid,

(c2) 25 to 80 mole-% of an alkyl methacrylate having at least 4 carbon atoms in the alkyl group, a homopolymer of said methacrylate (c2) having a glass transition temperature of not more than 20° C., and

(c3) 3 to 20 mole-% of a monomeric ethylenically unsaturated compound which is copolymerizable with said acid (c1) and said methacrylate (c2), a homopolymer of said compound (c3) having a glass transition temperature of at least 80° C., wherein said copolymer has a mean molecular weight in the range from about 65,000 to 150,000 and is prepared by mass polymerization.

12. A transferable, dry photoresist film comprised of a radiation-polymerizable mixture comprising

(a) 30 to 70% by weight of a first compound capable of undergoing free radical polymerization, said first compound containing at least two terminal ethylenically unsaturated groups and having a boiling point above 100° C. under atmospheric pressure,

(b) 0.01 to 10% by weight of a second compound capable of initiating said polymerization of said first compound when exposed to actinic radiation, and

(c) 20 to 70% by weight of a water-insoluble copolymer which is soluble in aqueous alkaline solutions and which comprises

(c1) 20 to 60 mole-% of acrylic acid and methacrylic acid,

(c2) 25 to 80 mole-% of an alkyl methacrylate having at least 4 carbon atoms in the alkyl group, a homopolymer of said methacrylic (c2) having a glass transition temperature of not more than 20° C., and

(c3) 3 to 20 mole-% of a monomeric ethylenically unsaturated compound which is copolymerizable with said acid (c1) and said methacrylate (c2), a homopolymer of said compound (c3) having a glass transition temperature of at least 80° C.,

wherein said copolymer has a mean molecular weight in the range from about 65,000 to 150,000 and is prepared by mass polymerization.

4,705,741

PROCESSLESS COLOR IMAGING AND FILM THEREFOR

David F. Lewis, Monroe, Conn., and James R. Kuszewski, Warren, N.J., assignors to GAF Corporation, Wayne, N.J.

Filed Mar. 14, 1986, Ser. No. 839,391
Int. Cl.[4] G03C 1/727
U.S. Cl. 430—333 **18 Claims**

1. An image receptive film capable of multicolor development by energy transmitted by a source of radiant energy which comprises:

(a) a first surface imaging layer containing a normally solid, halogenated aliphatic polymeric binder capable of dehydrohalogenation upon transmission of energy from a radiant energy source at a point of impact and a first polyphenylmethane dye precursor compound homogeneously dispersed throughout said halogenated aliphatic polymer which interacts with hydrogen halide to form the corresponding halide salt dye;

(b) a second imaging layer contiguously disposed below said first layer and containing a normally solid, halogenated aliphatic polymeric binder capable of dehydrohalogenation upon transmission of energy from a radiant energy source at a point of impact and a second, distinct polyphenylmethane dye precursor compound homogeneously dispersed throughout the halogenated aliphatic polymer in said second imaging layer, which interacts with hydrogen halide to form the corresponding halide salt dye of a color distinguishable from the color of the halide salt dye of said first imaging layer and

(c) a conductive support for said first and second imaging layers.

4,705,742

PROCESSLESS MULTICOLOR IMAGING

David F. Lewis, Monroe, Conn., assignor to GAF Corporation, Wayne, N.J.

Filed Sep. 23, 1985, Ser. No. 778,938
Int. Cl.[4] G03C 7/00
U.S. Cl. 430—333 **16 Claims**

1. The process of subjecting an image receptive film having a surface layer of a photosensitive polyacetylenic compound to a plurality of separate radiant energy exposures at distinctive dosage intensity levels the exposure at higher intensity being effected with a particulate source of irradiation, each exposure at said distinctive dosage intensity level being limited to a divisible portion of the overall image to be transmitted, so as to develop exposed discrete portions of the image in the corresponding divided portion po a color distinguishable from the color of any other exposed portion resulting from another exposure at a dissimilar dosage intensity level in said surface layer.

4,705,743

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

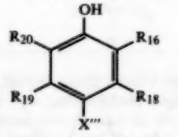
Keiji Mihayashi, and Shunji Takada, both of Kanagawa, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Filed Dec. 12, 1984, Ser. No. 681,032
Claims priority, application Japan, Dec. 12, 1983, 58-233845
Int. Cl.[4] G03C 1/40, 7/34, 7/36, 7/38
U.S. Cl. 430—385 **12 Claims**

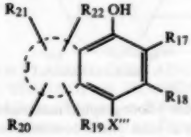
12. A method of forming a color image comprising developing an imagewise exposed silver halide color photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer, wherein the photographic light-sensitive material has a layer containing both a non-diffusible coupler capable of producing a dye of such mobility that controlled image smearing occurs upon reaction with the oxidation product of a color developing agent and a silver halide emulsion in which silver halide grains containing at least 10 mol% of silver iodide grains account for at least about 40% by weight of the total silver halide grains in the emulsion with an aqueous alkaline solution containing a color developing agent; wherein the non-diffusible coupler is a coupler represented by the following general formula (A):

$$(Cp)_aX \qquad (A)$$

wherein Cp represents a coupler component which yields a dye of such mobility that controlled image smearing occurs and improves graininess; X represents a component which is bonded to the coupling position of the coupler component, which is released upon a reaction with the oxidation product of a color developing agent and which contains a ballast group having from 8 to 32 carbon atoms; and a represents 1 or 2; and the non-diffusible coupler represented by the formula (a) is a coupler represented by the following general formulae (XV) or (XVI)



(XV)



(XVI)

wherein R_{16} represents a hydrogen atom, an aliphatic group having 10 or less carbon atoms, an alkoxy group having 10 or less carbon atoms, an aryloxy group, an acylamido group, a sulfonamido group and a ureido group represented by the general formulae (XVII) to (XIX) as described below, or a carbamoyl group represented by the general formula (XX) as described below:

$$-NH-CO-G \qquad (XVII)$$

$$-NH-SO_2-G \qquad (XVIII)$$

-continued

—NHCONH—G (XIX)

(XX)

wherein G and G', which may be the same or different, each represents a hydrogen atom, provided that G and G' are not hydrogen atoms at the same time and that the total number of carbon atoms included in G and G' is form 1 to 12, an aliphatic group having from 1 to 12 carbon atoms, an aryl group or a heterocyclic group, and each of these groups may be substituted with a halogen atom, a nitro group, a cyano group, a hydroxy group, a carboxy group, an amino group, an alkyl group, an aryl group, an alkoxycarbonyl group, an acyloxycarbonyl group, an amido group, an imido group, a carbamoyl group, a sulfamoyl group, an alkoxy group, an aryloxy group or a sulfonyl group; R_{17} represents a hydrogen atom, an aliphatic group having 12 or less carbon atoms or a carbamoyl group represented by the general formula (XX), R_{18}, R_{19}, R_{20}, R_{21} and R_{22} each represents a hydrogen atom, a halogen atom, an alkyl group, an aryl group, an alkoxy group, an alkylthio group, a heterocyclic group, an amino group, a carbonamido group, a sulfonamido group, a sulfamoyl group or a carbamoyl group; J represents a non-metal atomic group necessary to form a 5-membered or 6-membered ring; and X''' represents a group which contains a group having from 8 to 32 carbon atoms, which is bonded to the coupling position through —O—, —S—, or —N=N—, and which is capable of being released upon a coupling reaction with an oxidation product of an aromatic primary amine developing agent.

4,705,744

COLOR PHOTOGRAPHIC MATERIALS HAVING RED COLOR SATURATION AND IMPROVED DISCRIMINATION OF GREEN COLORS

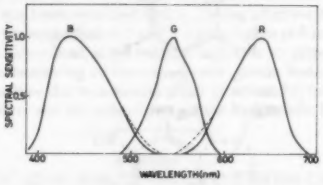
Noboru Sasaki, Odawara, and Koji Takahashi, Hadano, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 5, 1985, Ser. No. 751,961

Claims priority, application Japan, Jul. 6, 1984, 59-140240

Int. Cl.[4] G03C *1/46, 7/00*

U.S. Cl. 430—505 **21 Claims**



1. A silver halide color photographic material comprising a support having thereon at least one blue-sensitive silver halide emulsion layer comprising a yellow dye-forming coupler, at least one green-sensitive silver halide emulsion layer comprising a magenta dye-forming coupler, and at least one red-sensitive silver halide emulsion layer comprising a cyan dye-forming coupler,

characterized in that the wavelength (λ_G) weight-averaged between 500 nm and 600 nm of spectral sensitivity distribution of all green-sensitive layers is located in the range of 520 nm to 580 nm, the wavelength (λ_{-R}) weight-averaged between 500 nm and 600 nm of spectral sensitivity distribution of one or more donor layers which exert an interlayer effect to at least one red-sensitive emulsion layer comprising a cyan dye-forming coupler is located in the range of 500 nm to 560 nm, (λ_G) is greater than (λ_{-R}), and the difference of ($\lambda_G - \lambda_{-R}$) is greater than 5 nm:

wherein said weight-averaged wavelength (λ_G) is defined by the following equation:

$$\overline{\lambda}_G = \frac{\int_{500\ nm}^{600\ nm} \lambda \cdot S_G(\lambda)\, d\lambda}{\int_{500\ nm}^{600\ nm} S_G(\lambda)\, d\lambda}$$

wherein $S_G(\lambda)$ represents said spectral sensitivity distribution by equi-energy spectrum of all green-sensitive layers,

and said weight-averaged wavelength (λ_{-R}) is defined by the following equation:

$$\overline{\lambda}_{-R} = \frac{\int_{500\ nm}^{600\ nm} \lambda \cdot S_{-R}(\lambda)\, d\lambda}{\int_{500\ nm}^{600\ nm} S_{-R}(\lambda)\, d\lambda}$$

wherein $S_{-R}(\lambda)$ represents the spectral sensitivity distribution of said one or more donor layers.

4,705,745

PHOTOGRAPHIC MATERIALS AND COLOR PROOFING SYSTEM

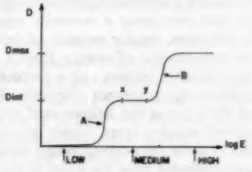
Jonathan P. Kitchin, Hertfordshire; Stephen R. Powers, Harlow; Keith A. Penfound, Saffron Walden; Peter J. Finn, Harlow, and Michael G. Fisher, Epping, all of England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 3, 1986, Ser. No. 835,629

Claims priority, application United Kingdom, Mar. 8, 1985, 8506092

Int. Cl.[4] G03C *1/46, 7/00*

U.S. Cl. 430—505 **22 Claims**



1. A radiation-sensitive element suitable for the preparation of half-tone colour proofs comprising a substrate bearing at least four separate imaging media coated as layers thereon, said imaging media including:

(1) an imaging medium capable of forming a yellow image upon imagewise exposure and processing,

(2) an imaging medium capable of forming a magenta image upon imagewise exposure and processing,

(3) an imaging medium capable of forming a cyan image upon imagewise exposure and processing, and

(4) an imaging medium capable of forming a black image or a balancing black upon imagewise exposure and processing,

each imaging medium having a maximum spectral sensitivity at a wavelength different from that of the maximum sensitivity of the other imaging media.

4,705,746

PHOTOGRAPHIC POLYOLEFIN COATED PAPER

Shigehisa Tamagawa, and Tetsuro Fuchizawa, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 657,765, Oct. 4, 1984, abandoned. This application Apr. 15, 1986, Ser. No. 852,398

Claims priority, application Japan, Oct. 4, 1983, 58-185303

Int. Cl.[4] G03C *1/76*

U.S. Cl. 430—538 7 Claims

1. A photographic paper comprising a paper sheet coated on each side with a polyolefin resin layer and a photographic emulsion layer provided on the polyolefin resin layer on the front side, which is characterized in that the polyolefin resin layer on the back side is provided with a coating layer consisting essentially of:

a latex selected from the group consisting of MBR latex, carboxylated MBR latex, SBR latex, carobxylated SBR latex, SMBR latex and carboxylated SMBR Latex;

an alkyldiphenylether sulfonate or a formalin condensate of naphthalenesulfonate;

a colloidal silica;

an alkaline salt aluminate; and

an active halogen-containing curing agent.

4,705,747

COLOR PHOTOGRAPHIC RECORDING MATERIAL CONTAINING A SILVER HALIDE EMULSION AND A PROCESS FOR ITS PRODUCTION

Sieghart Klötzer, Cologne; Bruno Mücke; Günther Mahlberg, both of Bergisch Gladbach, and Manfred Becker, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

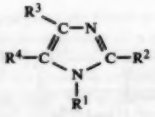
Filed Feb. 24, 1986, Ser. No. 832,432

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1985, 3507830

Int. Cl.[4] G03C *1/06, 1/40, 1/02*

U.S. Cl. 430—550 7 Claims

1. A color photographic recording material containing color couplers and comprising at least one photosensitive silver halide emulsion layer and, optionally, other layers on a layer support, characterized in that the silver halide emulsion contains silver halide crystals with at least 20 mole-% of silver chloride and at most 80 mole-% of silver bromide of which the crystal formation and/or crystal growth were carried out in the presence of an iridium compound and an imidazole corresponding to the following formula



in which

R^1, R^2, R^3 and R^4 may be the same or different and represent hydrogen and/or an optionally substituted alkyl, alkenyl, aryl or aralkyl group.

4,705,748

ANTIGEN ASSOCIATED WITH EARLY DETECTION OF MAMMALIAN PREGNANCY

R. Garth Sasser, Moscow, and William C. Hamilton, Emmett, both of Id., assignors to Idaho Research Foundation, Inc., Moscow, Id.

Continuation of Ser. No. 516,173, Jul. 21, 1983, Pat. No. 4,554,256. This application Nov. 4, 1985, Ser. No. 794,932

The portion of the term of this patent subsequent to Nov. 19, 2002, has been disclaimed.

Int. Cl.[4] G01N *33/531, 33/542*

U.S. Cl. 435—7 4 Claims

1. A method for detecting pregnancy in a domestic animal host producing a protein cross-reactive with Protein B, which comprises combining milk from said host with antibody which specifically binds to Protein B, said Protein B being characterized as having a molecular weight in the range of about 47–53 kD, an isoelectric point in the range of about 4.0–4.4 and isolatable from bovine placental membrane homogenates; and detecting the presence of an immunological complex between said antibody to Protein B and an antigen in milk from said host, wherein complex formation is indicative of pregnancy in said host.

4,705,749

PROCESS AND REAGENT FOR THE DETERMINATION OF GLYCEROL WITH THE USE OF GLYCEROL KINASE

Peter Willnow, Bernried; Paul Lehmann, Tutzing; Joachim Ziegenhorn, Starnberg, and August W. Wahlefeld, Hohenpeissenberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Nov. 1, 1984, Ser. No. 667,279

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1983, 3340709

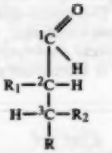
Int. Cl.[4] C12Q *1/48, 1/44, 1/26, 1/32, 1/28;* C12N *9/99*

U.S. Cl. 435—15 19 Claims

1. In a process for the determination of glycerol by reaction with ATP in the presence of glycerol kinase (GK) with the formation of glycerol-3-phosphate and ADP followed by a measuring step wherein glycerol-3-phosphate or ADP is determined by at least one subsequent enzymatic reaction followed by a measurement of the subsequent enzymatic reaction product,

the improvement comprising:

competitively inhibiting the glycerol kinase (GK) to render the reaction with ATP rate-determining for the whole reaction and pseudo-first order, by adding, as an inhibitor, a sugar of the formula:



(I)

in which carbon atoms 2 and 3 have the D-threo configuration, R is a carbohydrate radical containing up to 3 carbon atoms and R_1 and R_2 are hydroxyl or one of R_1 and R_2 is hydroxyl and the other is hydrogen.

4,705,750

PROMOTER PLASMID CONTAINING THE PROMOTER AND USE THEREOF IN TRANSFORMING BACILLUS

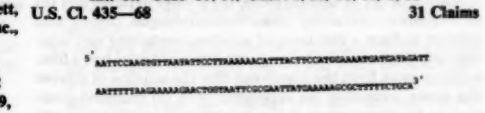
Kikuchi Masakazu, Toyono, and Nakahama Kazuo, Nagaokakyo, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 18, 1984, Ser. No. 683,203

Claims priority, application Japan, Dec. 26, 1983, 58-248645

Int. Cl.[4] C12P *21/00;* C12N *1/20, 15/00, 1/00*

U.S. Cl. 435—68 31 Claims



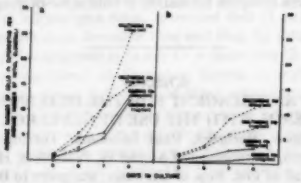
1. A recombinant DNA segment including the base sequence depicted in FIG. 1 or a portion thereof, which exhibits promoter activity and a gene which is heterologous to Bacillus.

4,705,751

PROCESS FOR PREPARATION OF MULTIMERIC PLASMA FIBRONECTIN

Deane F. Mosher, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Dec. 28, 1983, Ser. No. 566,215
Int. Cl.[4] A61K *37/02*; C07K *15/14*; C12N *5/00*; C12P *21/00*
U.S. Cl. 435—68 21 Claims



1. A method for preparing multimeric fibronectin comprising the step of treating dimeric fibronectin with guanidine by preparing an aqueous solution of dimeric fibronectin and guanidine wherein the concentration of quanadine is at least 1M, whereby multimeric fibronectin is formed within the solution.

4,705,752

PROCESS FOR THE ENZYMATIC HYDROLYSIS OF D-α-AMINO-ACID AMIDES

Wilhelmus H. J. Boesten, Sittard, and Maria J. H. Cals, Munstergeleen, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Sep. 25, 1985, Ser. No. 779,851
Claims priority, application Netherlands, Oct. 11, 1984, 8403093
Int. Cl.[4] C12P *13/04*, *13/08*, *13/06*; C12N *9/78*
U.S. Cl. 435—106 8 Claims

1. A process for the enzymatic hydrolysis of a D-α-amino-acid amide to the corresponding D-α-amino-acid, wherein an aqueous solution of the D-α-amino-acid amide is contacted with an aminoacylamidase-containing preparation obtained from a culture of *Rhodococcus erythropolis* or a mutant thereof and the D-α-amino-acid is subsequently recovered from the obtained hydrolysate.

4,705,753

BIOLOGICALLY ACTIVE ACRYLONITRILE-BASED COPOLYMERIC MEMBRANE

Harry P. Gregor, 410 Riverside Dr., New York, N.Y. 10025; Paul I. Dalven, 28/08 Chatam Sofer St., A'manuel 90943, Israel; James R. Hildebrandt, 560 Riverside Dr., New York, N.Y. 10027; Leonard T. Hodgins, 19 Jane St., Closter, N.J. 07624; Anthony J. Laccetti, 60 Haven Ave., New York, N.Y. 10032, and Abraham Shamir, 530 West 113th St., New York, N.Y. 10025

Filed Jun. 8, 1984, Ser. No. 618,652
Int. Cl.[4] C12N *11/08*, *11/06*, *11/00*; G01N *33/545*
U.S. Cl. 435—180 9 Claims

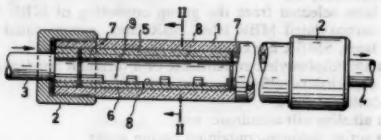
1. A process for producing a biologically active membrane comprising, in a water-miscible solvent forming a solution of a water insoluble copolymer of acrylonitrile with about 1 to 20.5 mole percent of at least one monomer selected from the group consisting of (a) an aminostyrene, (b) a vinyl pyridine and (c) an N-hydroxy-containing substituted-acrylamide, casting said solution to form a thin layer of solution, contacting said solution with water thereby to coagulate the copolymer into a film, washing away from the copolymer film the solution of solvent and water, activating the copolymer with (a) trichloro-s-triazine or by diazotization if the monomer is aminostyrene (b) cyanogenbromide if the monomer is vinyl pyridine or (c) trichloro-s-triazine if the monomer is an N-hydroxy-containing substituted-acrylamide, and then coupling to the activated copolymer a ligand selected from the group consisting of glucose isomerase, chymotrypsin and Protein A.

4,705,754

BIOFOULING SIDE-STREAM APPARATUS (BSSA) FOR MONITORING THE MICROBIAL GROWTH IN OILFIELD WATER SYSTEMS

Pere Penina-Surinach, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 19, 1986, Ser. No. 897,827
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1985, 3529848
Int. Cl.[4] C12M *1/00*
U.S. Cl. 435—287 1 Claim



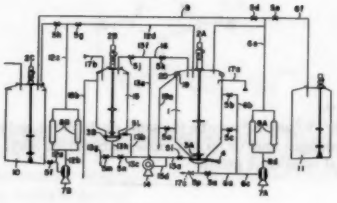
1. Biofouling side-stream apparatus for continuously monitoring microbial growth in oilfield water systems comprising a pipe of transparent material, screw-on caps, one at each end of the pipe sealingly connected to the pipe, each end cap having an opening therein, an inlet line extending through one of the cap openings and an outlet line extending through the other cap opening, and a plurality of steel sleeves held within the pipe at its upper edge by a bar in the longitudinal direction of the pipe and at its lower edge by a rail having a U-shaped cross-section, the lower U-shaped rail including recesses for receiving the steel sleeves, and means spacing the upper bar at a distance from the lower U-shaped rail.

4,705,755

APPARATUS FOR COLLECTING LYSOZYME FROM EGG WHITE BY ADSORPTION

Mineo Hasegawa, Hachioji, and Kitao Ozaki, Fuchu, both of Japan, assignors to Kewpie Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 445,716, Nov. 30, 1982, abandoned. This application Jul. 19, 1985, Ser. No. 756,552
Claims priority, application Japan, May 31, 1982, 57-92513
Int. Cl.[4] C12M *1/02*, *1/00*; C12N *9/36*; B01D *15/02*
U.S. Cl. 435—316 7 Claims



1. An apparatus for collecting lysozyme in egg white by adsorption, comprising:

a lysozyme adsorption tank equipped therein with first stirring means for stirring an egg white solution and an ion-exchange resin and having a strainer provided in a lower portion thereof;

a receptacle having an inlet and an outlet;

a water and resin tank having second stirring means and a strainer positioned therein;

a first liquid discharge pipe extending from a bottom of said lysozyme adsorption tank;

a second liquid discharge pipe extending from a side wall of said lysozyme adsorption tank at a location for withdrawing liquid from above the resin when the resin is at rest, said first and second liquid discharge pipes comprising means for draining off liquid from said lysozyme adsorption tank;

positive displacement pump means, an inlet of said positive displacement pump means being in communication with said first and second liquid discharge pipes;

a third liquid discharge pipe communicating an outlet of said positive displacement pump means with said inlet of said receptacle for transferring an egg white solution to said receptacle after removal of lysozyme;

a first resin discharge pipe extending from a lower portion of said side wall of said lysozyme adsorption tank at a location above said strainer;

a second resin discharge pipe extending from a lower portion of said water and resin tank;

centrifugal pump means, an inlet of said centrifugal pump means being in fluid communication with said first and second resin discharge pipes;

third and fourth resin discharge pipes in fluid communication with an outlet of said centrifugal pump means and respectively communicating said outlet of said centrifugal pump means with inlets of said water and resin tank and said lysozyme adsorption tank; and

valve means for enabling the selective transfer of liquid by said centrifugal pump means from said lysozyme adsorption tank to said water and resin tank and from said water and resin tank to said lysozyme adsorption tank through said first, second, third and fourth resin discharge pipes.

4,705,756

METHOD OF DETERMINING THE EXISTENCE AND/OR THE MONITORING OF A PATHOLOGICAL CONDITION IN A MAMMAL

Charles R. Spillert, West Orange; William D. Suval, Liberty Corners, and Eric J. Lazaro, Jersey City, all of N.J., assignors to University of Medicine and Dentistry of New Jersey, Newark, N.J.

Continuation-in-part of Ser. No. 703,120, Feb. 19, 1985, abandoned, which is a continuation of Ser. No. 538,783, Oct. 4, 1983, abandoned, which is a continuation-in-part of Ser. No. 440,540, Jan. 26, 1983, abandoned. This application May 16, 1985, Ser. No. 734,799

Int. Cl.[4] G01N *33/86*

U.S. Cl. 436—64 **20 Claims**

1. A method for analyzing the blood of a mammal to determine the presence or development of a pathology known to cause abnormalities in the immune response system and/or the blood coagulation of the mammal consisting essentially of:

A. preparing a quantity of anticoagulated whole blood from a sample of whole blood taken from a mammal;

B. taking an aliquot portion of said anticoagulated blood and introducing said aliquot portion into a first container having therein a vehicle, and thereby preparing a control sample;

C. taking a further aliquot portion of said anticoagulated blood and introducing said further aliquot portion into a second container having therein an immunomodulator and a vehicle and thereby preparing an activated sample, said immunomodulator present in said activated sample in an amount insufficient to independently cause the coagulation of the whole blood in said sample;

D. incubating said control sample and said activated sample at a predetermined suitable incubation temperature from about 2 to about 4 hours;

E. initiating clotting activity and measuring a reaction parameter for each of said control sample and said activated sample; and

F. Identifying the presence of a particular pathology by comparing the reaction parameters measured in Step E with similar reaction parameters measured from a mammal in a healthy state.

4,705,757

METHOD FOR FLUOROMETRIC ANALYSIS OF CATECHOL AMINES

Yosuke Ohkura, Fukuoka, Japan, assignor to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Mar. 29, 1985, Ser. No. 717,664

Claims priority, application Japan, Mar. 29, 1984, 59-62890

Int. Cl.[4] G01N *21/76, 33/00*

U.S. Cl. 436—172 **20 Claims**

3. A method for the fluorometric analysis of a catecholamine, comprising:

(i) adding a catecholamine to a solution of 1,2-diphenylethylenediamine containing an oxidizing agent, at a pH 4 to 10 to form a mixture;

(ii) permitting the mixture to stand for more than 1 minute at a temperature greater than 15° C. to make the catecholamine fluorescent; and

(iii) measuring resulting fluorescence.

4,705,758

ADENOSINE RECEPTOR ASSAY AND KIT

Robert F. Bruns, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 19, 1984, Ser. No. 622,353

Int. Cl.[4] G01N *33/567, 33/534*

U.S. Cl. 436—504 **12 Claims**

1. A method for measuring affinities of compounds of adenosine A_2 receptors without significant interference from adenosine A_1 receptors comprising: contacting a preparation (solution, suspension, or solid) containing both A_1 and A_2 receptors with a solution or solutions containing at least one labelled ligant which has high affinity for both A_1 and A_2 receptors and a suitable quantity of an unlabelled displacer which selectively occupies A_1 receptors without significant occupation of A_2 receptors, wherein the displacer contains at least one compound selected from the group consisting of: N^6(3-hydroxypropyl)adenosine, and N^6-cycloalkyl adenosines in which the alkyl moiety contains 5, 7 or 8 carbon atoms; and measuring the amount of labelled ligand as an indication of affinity to the A_2 receptors.

4,705,759

HIGH POWER MOSFET WITH LOW ON-RESISTANCE AND HIGH BREAKDOWN VOLTAGE

Alexander Lidow, Manhatta, and Thomas Herman, Redondo, both of Calif., assignors to International Rectifier Corporation, Los Angeles, Calif.

Division of Ser. No. 232,713, Feb. 9, 1981, Pat. No. 4,376,286, which is a continuation of Ser. No. 951,310, Oct. 13, 1978, abandoned. This application Jan. 10, 1983, Ser. No. 456,813

Int. Cl.[4] H01L *21/265, 21/31*

U.S. Cl. 437—29 **7 Claims**

1. The method of manufacture of a high power MOSFET device which comprises the steps of:

(a) forming an insulation coating on the upper surface of a flat chip of a monocrystalline semiconductor of one of the conductivity types;

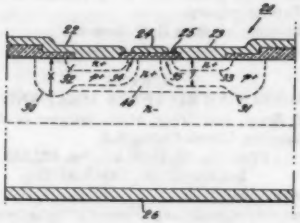
(b) opening at least first and second spaced windows in said insulation coating which have at least first respective portions thereof which are elongated and parallel to one another;

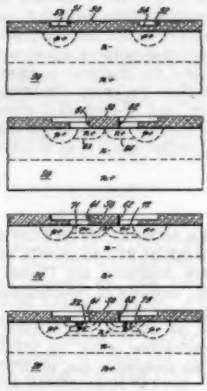
(c) applying impurity carriers of a conductivity type opposite said one conductivity type to said upper surface which is exposed by said first and second windows and heating said chip to cause said carriers to diffuse into said chip to form first and second respective regions of said opposite conductivity type in said chip which have a first depth;

(d) opening at least third and fourth spaced windows in any insulation coating on said upper surface which are coex-

tensive with and adjacent to said first and second windows; said third and fourth windows being disposed inwardly of the space between said first and second windows and being laterally removed from atop said first and second regions respectively;

(e) applying impurity carriers of said opposite conductivity type to said upper surface which is exposed by said third and fourth windows and heating said chip to cause said carriers to diffuse into said chip to form third and fourth respective regions of said opposite conductivity type which are continuous with the adjacent sides of said first and second regions respectively but are shallower than said first and second regions; the opposite edges of parallel portions of said third and fourth regions being laterally diffused until they are spaced from one another by a given distance by a common neck region of said one conductivity type of said chip;





(f) applying impurity carriers of said one conductivity type to said upper surface which is exposed by said third and fourth windows and heating said chip to cause said carriers from said one conductivity type to diffuse into said third and fourth regions for only a portion of the depth and width of said third and fourth regions to define first and second source regions; said first and second source regions having facing edges which are spaced from said common neck region, thereby to define first and second channel regions in said third and fourth regions respectively;

(g) and forming an insulated gate means atop said upper surface and over said first and second channel regions, and forming source electrode means on said source regions and drain electrode means on the surface of said chip which is opposite said upper surface.

4,705,760

PREPARATION OF A SURFACE FOR DEPOSITION OF A PASSINATING LAYER

Grzegorz Kaganowicz, Belle Mead; Ronald E. Enstrom, Skillman, both of N.J., and John W. Robinson, Levittown, Pa., assignors to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 819,286, Jan. 16, 1986, abandoned. This application Jun. 6, 1986, Ser. No. 871,316

Int. Cl.[4] H01L *21/306, 21/318*

U.S. Cl. 437—234 **10 Claims**

1. In a method of making a semiconductor device comprisisng:

forming a first region of a first conductivity type, said region comprising indium phosphide;

forming a second region of a second conductivity type adjacent said first region with a semiconductor junction therebetween, which junction extends to a surface of said device; and

depositing a passivating layer over said surface to overlie said junction, said passivating layer being deposited prior to or subsequent to formation of the second region;

wherein the improvement comprises treating said surface with an aqueous ammonium fluoride-hydrogen fluoride solution, thereafter subjecting said surface to a plasma in an oxygen-free, nitrogen-containing ambient at a temperature between about 25° C. and 200° C. and immediately depositing the passivating layer without exposing said surface to oxygen.

4,705,761

CERAMIC STRUCTURE HAVING THERMAL SHOCK RESISTANCE

Tetsuo Kosugi, Toukai, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP84/00377, § 371 Date Mar. 25, 1985, § 102(e) Date Mar. 25, 1985, PCT Pub. No. WO85/00588, PCT Pub. Date Feb. 14, 1985

PCT Filed Jul. 25, 1984, Ser. No. 718,018

Claims priority, application Japan, Jul. 27, 1983, 58-135887

Int. Cl.[4] C04B *35/56, 35/58*

U.S. Cl. 501—87 **7 Claims**

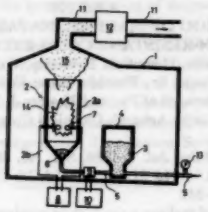
1. A composite sintered ceramic structure having a high thermal shock resistance which comprises a first fine particle component consisting essentially of at least one member selected from the group consisting of Si_3N_4 and sialon and forming a matrix for the composite sintered ceramic structure and a second fine particle component consisting essentially of at least one member selected from the group consisting of YC, TiB_2, HfB_2VB_2, VN, VC, NbB_2, NbN, TaB_2, CrB_2, MoB_2 and W_2B and forming aggregates of particles which are more brittle than said first fine particle component and dispersed throughout the matrix whereby cracks developed in the composite sintered ceramic structure are incorporated into the aggregates and are bent or branched therethrough.

4,705,762

PROCESS FOR PRODUCING ULTRA-FINE CERAMIC PARTICLES

Kazuhide Ota, Okazaki, and Susumu Abe, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 8, 1985, Ser. No. 699,909
Claims priority, application Japan, Feb. 9, 1984, 59-22463; May 29, 1984, 59-109108
Int. Cl.[4] C04B 35/02; C01B 13/14
U.S. Cl. 501—87 25 Claims



1. A process for producing ultra-fine ceramic particles which comprises:

(a) forming a powdered dust cloud composed of metal powder and a reaction gas containing an element for reaction with said metal powder,

(b) igniting the same to cause explosive burning and synthesizing the ultra-fine ceramic particles, and

(c) gathering said ultra-fine ceramic particles; and wherein the reaction enthalpy, ΔH_0, is sufficiently large to generate sufficient heat to evaporate the metal, thereby causing an explosion of the powdered dust after ignition, and wherein the value T, which is the value obtained by dividing the temperature T_0(°K.) at the free energy of th product ΔG_0-0 by the boiling point T_1(°K.) of the constituent metal of the product, is greater than 0.6, indicating that the reaction product is stable at the reaction temperature.

4,705,763

HIGH ZIRCONIA FUSED REFRACTORY PRODUCT

Atsushi Hayashi, Tokyo; Kiyoharu Kuwabara, Yokohama; Kohzo Sakai, Kawasaki, and Toshihiro Ishino, Takasago, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Aug. 21, 1986, Ser. No. 898,497
Claims priority, application Japan, Sep. 10, 1985, 60-198674
Int. Cl.[4] C04B 35/48
U.S. Cl. 501—103 8 Claims

1. A high zirconia fused refractory product having high resistivity and excellent corrosion resistance at high temperature, consisting essentially of:

85–97% by weight of ZrO_2;

0.05–3% by weight of P_2O_5;

2–10% by weight of SiO_2;

0.05–5% by weight of B_2O_3;

alkali metal oxides in an amount of less than 0.1% by weight; and

Al_2O_3 in an amount of less than 1% by weight.

4,705,764

ESTERIFICATION AND/OR ESTER INTERCHANGE CATALYST

Satoshi Matsumoto, Kumamoto, Japan, assignor to Research Development Corporation of Japan, Japan

Filed Sep. 26, 1986, Ser. No. 912,427
Claims priority, application Japan, Oct. 3, 1985, 60-219140; Dec. 14, 1985, 60-280220; Jun. 10, 1986, 61-132618
Int. Cl.[4] B01J 31/06, 31/02
U.S. Cl. 502—62 18 Claims

1. A process for the preparation of a highly-crosslinked polyol polytitanate useful as an esterification and/or ester interchange catalyst, which process comprises the steps of heating an alkoxy titanium with a polyol to form a reaction product, de-alcoholizing the reaction product by heating the reaction product under reduced pressure to form a highly-crosslinked high-molecular solid product, and treating the solid product with water to convert the solid product to a hydrate and activate is surface.

2. The process as claimed in claim 1, wherein the alkoxy titanium and the polyol are reacted in the presence of a carrier.

3. The process as claimed in claim 2, wherein the carrier is selected from the group consisting of silica, alumina, zeolite, a molecular sieve and activated carbon.

4,705,765

HYDROSILYLATION CATALYST, METHOD FOR MAKING AND USE

Larry N. Lewis, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 810,629, Dec. 19, 1985, abandoned. This application Mar. 2, 1987, Ser. No. 21,037
Int. Cl.[4] B01J 31/00; C07F 7/04; C08G 77/06
U.S. Cl. 502—152 6 Claims

1. A colloidal hydrosilylation catalyst comprising,

(A) the reaction product of

(i) a silicon hydride or siloxane hydride, and

(ii) a platinum Pt(O) or Pt(II) complex, and

(B) 2 to 20 parts by weight of aprotic solvent, per part of (A), where there is utilized in (A), 6 to 50 moles of ≡SiH in (i), per mole of Pt in (ii).

4,705,766

MIXTURE OF A MOLYBDENUM CARBOXYLATE AND A MOLYBDENUM DITHIOPHOSPHATE OR A MOLYBDENUM DITHIOCARBAMATE FOR USE IN A HYDROVISBREAKING PROCESS

Jerald A. Howell, and Simon G. Kukes, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 677,134, Nov. 30, 1984, Pat. No. 4,608,152. This application May 23, 1986, Ser. No. 866,552
Int. Cl.[4] B01J 31/04, 31/12
U.S. Cl. 502—167 17 Claims

1. A molybdenum containing mixture selected from the group consisting of a mixture comprising a molybdenum dithiophosphate and a molybdenum carboxylate and a mixture comprising a molybdenum dithiocarbamate and a molybdenum carboxylate.

4,705,767

SULFACTANTS IN ACID-PEPTIZED CATALYST COMPOSITIONS

Wu-Cheng Cheng, Columbia, and Richard G. Donnelly, Bethesda, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Dec. 15, 1986, Ser. No. 941,672
Int. Cl.[4] B01J 21/04, 21/12
U.S. Cl. 502—167 20 Claims

1. In the preparation of a catalyst, comprising admixing a member of the group selected from powdered alumina, powdered silica-alumina, and mixtures thereof, with an acidic

peptizing agent, forming a paste from the peptized group member, extruding the paste to form an extrudate, and calcining the extrudate to form a porous catalyst product, the improvement comprising admixing said paste with a surface active agent prior to extrusion, thereby to provide macropores in the porous catalyst product.

4. Method according to claim 1 in which the surface active agent is a member selected from the group consisting of acetylenic glycols, polyoxyethylene alcohols, polyoxyethylene alkylamines, polyoxyethylene alkylamides, polyols, and fatty amines.

4,705,768

COPRECIPITATE OF METAL PHOSPHATES

Daniel M. Coombs, Borger, Tex.; Ted H. Cymbaluk, Bartlesville, Okla.; Brent J. Bertus, Bartlesville, Okla., and Simon G. Kukes, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 859,980, May 5, 1986, Pat. No. 4,680,105. This application Jan. 20, 1987, Ser. No. 4,514

Int. Cl.[4] B01J *27/198, 27/19, 27/185, 27/18*

U.S. Cl. 502—213 **26 Claims**

1. A composition of matter, useful as a catalyst composition for hydrodemetallizing liquid hydrocarbon-containing feed streams, comprising a coprecipitate of nickel phosphate and titanium phosphate.

11. A composition of matter, useful as a catalyst composition for hydrodemetallizing liquid hydrocarbon-containing feed streams, consisting essentially of a mixture of

(A) a coprecipitate of nickel phosphate and titanium phosphate, and

(B) at least one inorganic refractory material being present in the amount of 1 to about 90 weight-%, based on the total weight of said mixture.

20. A composition of matter, useful as a catalyst composition for hydrodemetallizing liquid hydrocarbon-containing feed streams, consisting essentially of a coprecipitate of

(a) nickel phosphate,

(b) titanium phosphate

(c) at least one metal phosphate selected from the group consisting of cobalt phosphate, iron phosphate, chromium phosphate, molybdenum phosphate, vanadium phosphate, copper phosphate and zirconium phosphate,

wherein the weight of component (c) is less than the combined weight of components (a) and (b).

4,705,769

COMPOSITION OF MATTER FOR CONVERSION OF C_3 AND C_4 HYDROCARBONS

John H. Kolts, Ochelata, and Gary A. Delzer, Bartlesville, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 758,938, Jul. 25, 1985, Pat. No. 4,621,162. This application Jul. 31, 1986, Ser. No. 902,801

Int. Cl.[4] B01J *21/04, 21/06, 21/10, 23/02, 23/26, 23/34, 23/74*

U.S. Cl. 502—241 **16 Claims**

1. A composition of matter selected from the group consisting of:

(a) a composition consisting essentially of: about 0.1 weight-% to about 30 weight-% of each of (1) at least one oxide of at least one element selected from the group consisting of silicon, aluminum and titanium and (2) at least one oxide of manganese and the balance being (3) at least one oxide of magnesium;

(b) a composition consisting essentially of: about 0.1 weight-% to about 30 weight-% of each of (1) at least one oxide of at least one element selected from the group consisting of silicon, aluminum and titanium, (2) at least one oxide of at least one metal selected from the group consisting of calcium, strontium, barium, tin and antimony and (3) at least one oxide of manganese and the balance being (4) at least one oxide of magnesium;

(c) a composition consisting essentially of: about 0.1 weight-% to about 30 weight-% of each of (1) at least one oxide of at least one element selected from the group consisting of silicon, aluminum and titanium and (2) at least one oxide of iron and the balance being (3) at least one oxide of magnesium; and

(d) a composition consisting essentially of: about 0.1 weight-% to about 30 weight-% of each of (1) at least one oxide of at least one element selected from the group consisting of silicon, aluminum and titanium, (2) at least one oxide of iron and (3) at least one oxide of manganese and the balance being (4) at least one oxide of magnesium.

4,705,770

METHOD OF MAKING ANATASE-TITANIA ATTRITION-RESISTANT CATALYST COMPOSITION

Leonard A. Cullo, Hempfield Township, Westmoreland County; Elliott V. Nagle, Jr., Franklin Boro; Edward F. Restelli, Jr., Oakmont Boro, all of Pa., and Thomas J. Yogan, Ft. Mitchell, Ky., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Filed Jul. 7, 1986, Ser. No. 882,874

Int. Cl.[4] B01J *21/06;* **C07C** *5/25;* **C07D** *307/89*

U.S. Cl. 502—242 **6 Claims**

1. Method of making a catalyst or catalyst support consisting essentially of impregnating an attrition resistant, porous substrate having a pore volume greater than 0.1 cc/g with from 2 to 95% TiO_2 by wetting the substrate with a solution of a titanyl sulfate, drying the impregnated substrate, heating it to decompose the titanyl sulfate, and calcining the resulting impregnated composition at a temperature of at least 450° C. to obtain a calcined composition which displays essentially the characteristics of anatase titania as shown by an anatase X-ray peak at d 3.52 and no rutile X-ray peak at d 3.25.

4,705,771

PROCESS AND CATALYST FOR THE PRODUCTION OF FORMALDEHYDE FROM METHANE

Nicholas D. Spencer, Washington, D.C., assignor to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 723,680, Apr. 16, 1985, Pat. No. 4,607,127. This application Jan. 6, 1986, Ser. No. 816,506

The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.

Int. Cl.[4] B01J *21/08, 31/00;* **C01B** *33/12*

U.S. Cl. 502—255 **7 Claims**

1. A catalyst suitable for the partial oxidation of methane comprising MoO_3 on a silica support made by the hydrolysis of silicon tetraalkoxides and having a silica purity of at least 99.99% silica, a total impurity level less than 100 ppm, and having a low sodium content of less than 50 ppm, said amount of MoO_3 being at least a catalytically effective amount and up to an amount where the Mo content is about 50% by weight of the catalyst.

4,705,772

COMPOSITION OF MATTER AND METHOD FOR CONVERSION OF C3 AND C4 HYDROCARBONS

John H. Kolts, Ochelata, and Gary A. Delzer, Bartlesville, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 758,936, Jul. 25, 1985, Pat. No. 4,620,052. This application Jul. 31, 1986, Ser. No. 891,010

Int. Cl.[4] B01J *21/10, 23/10, 23/18, 23/20, 23/26, 23/34, 23/74*

U.S. Cl. 502—303 **14 Claims**

1. A composition of matter selected from the group consisting of:

(a) a composition, consisting essentially of: about 0.1 weight-% to about 30 weight-% of each of (1) at least one oxide of chromium and (2) at least one oxide of manganese and the balance being (3) at least one oxide of at least one metal selected from the group consisting of magnesium, Lanthanum Series metals and niobium;

(b) a composition, consisting essentially of: about 0.1 weight-% to about 30 weight-% of each of (1) at least one oxide of chromium, (2) at least one oxide of at least one metal selected from the group consisting of calcium, strontium, barium, tin and antimony and (3) at least one oxide of manganese and the balance being (4) at least one oxide of at least one metal selected from the group consisting of magnesium, Lanthanum Series metals and niobium;

(c) a composition, consisting essentially of: about 0.1 weight-% to about 30 weight-% of each of (1) at least one oxide of chromium and (2) at least one oxide of iron and the balance being (3) at least one oxide of at least one metal selected from the group consisting of magnesium, Lanthanum Series metals and niobium; and

(d) a composition, consisting essentially of: about 0.1 weight-% to about 30 weight-% of each of (1) at least one oxide of chromium, (2) at least one oxide of iron and (3) at least one oxide of manganese and the balance being (4) at least one oxide of at least one metal selected from the group consisting of magnesium, Lanthanum Series metals and niobium.

4,705,773

WATER ABSORBENT POLYMER COMPOSITION

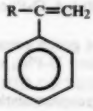
Bi Le-Khac, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 744,872, Jun. 17, 1985, Pat. No. 4,616,063, which is a continuation-in-part of Ser. No. 708,772, Mar. 6, 1985, abandoned. This application May 27, 1986, Ser. No. 866,643

Int. Cl.[4] B01J *20/26*

U.S. Cl. 502—402 **4 Claims**

1. An article having excellent water and saline liquid absorption capacity comprised of a polymer composition which comprises a first copolymer of recurring units of an α,β-ethylenically unsaturated dicarboxylic anhdyride and recurring units of at least one monomer selected from the group consisting of ethylene, propylene, isobutylene, a C_1 to C_4 alkyl acrylate, a C_1 to C_4 alkyl substituted methacrylate, vinyl acetate, methyl vinyl ether and a styrenic monomer having the formula:



wherein r represents hydrogen, an alkyl group having from 1 to 6 carbon atoms and wherein the benzene ring may be substituted with low molecular weight alkyl, or hydroxy groups; and, a multi arm block second copolymer of styrene and ethylene oxide, wherein at least a portion of the recurring anhydride units of said first copolymer have been hydrolyzed to form hydrogen atoms thereon and wherein at least a portion of the oxide groups on the ethylene oxide are interacted with the said hydrogen atom so that said first copolymer and said second copolymer are linked by hydrogen bonds, said second copolymer having the following formula

$$(A/B)_nX$$

wherein each A separately represents a polystyrene segment having a number average molecular weight of from about 10,000 to about 100,000; each B separately represents a polyethylene oxide segment having a number average molecular weight of from about 5,000 to about 200,000; X represents the radical of a polyfunctional coupling agent forming the nucleus of the multi arm block copolymer and n represents an integer from 2 to 12.

4,705,774

THERMOSENSITIVE IMAGE TRANSFER MEDIUM

Minoru Hagiri, Numazu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 16, 1986, Ser. No. 874,669

Claims priority, application Japan, Jun. 17, 1985, 60-131074

Int. Cl.[4] B41M *5/22*

U.S. Cl. 503—207 **11 Claims**

1. A thermosensitive image transfer medium consisting essentially of (i) an image transfer sheet comprising (a) a plastic film, (b) an undercoat layer formed thereon containing a porous filler having an average particle size of 1 to 10 μm and an oil absorption of 200 ml/100 g or less as measured in accordance with the Japanese Industrial Standard K 5101, with said porous filler being deposited in the amount of from 1 g/m^2 to 10 g/m^2 and (c) an image transfer layer comprising a leuco dye formed on said undercoat layer, and (ii) an acceptor sheet having an acceptor layer comprising a color developer which is capable of inducing color formation in said leuco dye.

4,705,775

RECORDING MATERIAL EMPLOYING CHROMOGENIC BISQUINAZOLINES

Rudolf Zink, Therwil, and Ian J. Fletcher, Magden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

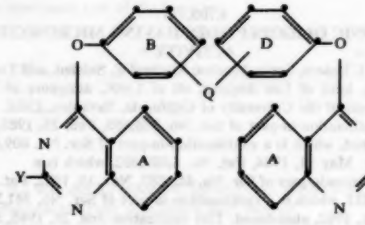
Continuation of Ser. No. 542,226, Oct. 14, 1983, Pat. No. 4,625,027. This application Aug. 7, 1986, Ser. No. 895,013

Claims priority, application Switzerland, Oct. 25, 1982, 6201/82; Jun. 28, 1983, 3523/83

Int. Cl.[4] B41M *5/16, 5/18, 5/22*

U.S. Cl. 503—218 **24 Claims**

1. A pressure sensitive or heat-sensitive recording material which comprises a support which contains, or has coated thereon, as a color former, at least one bisquinazoline of the formula



wherein

Q is the direct bond, an aliphatic or cycloaliphatic hydrocarbon radical containing not more than 8 carbon atoms, or is —CO—, —S— or —SO_2—, and

Y is the radical of a couplable compound selected from the group consisting of unsubstituted or N-monosubstituted or N,N-disubstituted anilines or naphthylamines, N-unsubstituted or N-substituted indoles, indolines, carbazoles, tetrahydrocarbazoles, dihydroquinolines, tetrahydroquinolines, dibenzylimides, benzomorpholines or phenylpyrazolines, and the rings

A, B and D each independently are unsubstituted or substituted by cyano, nitro, halogen, lower alkyl, phenyl, benzyl, lower alkoxy or lower alkoxycarbonyl.

4,705,776

RECORDING MATERIAL CONTAINING CHROMOGENIC 3,3-BISINDOLYL-4-AZAPHTHALIDES

Davor Bedekovic, Therwil, and Ian J. Fletcher, Magden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

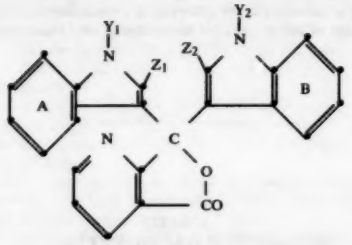
Division of Ser. No. 605,948, May 1, 1984, Pat. No. 4,587,343. This application Dec. 16, 1985, Ser. No. 808,990

Claims priority, application Switzerland, May 9, 1983, 2524/83

Int. Cl.[4] B41M *5/16, 5/18, 5/22*

U.S. Cl. 503—220 6 Claims

1. A pressure-sensitive or heat-sensitive recording material which comprises a support which contains, or on which is coated, at least one 3,3-bisindolyl-4-azaphthalide of the formula



wherein

Y_1 is hydrogen, C_1–C_{12}alkyl which is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, or is C_1–C_{12}acyl, benzyl or benzyl substituted by haogen, nitro, lower alkyl or lower alkoxy,

Y_2 is C_6–C_9alkyl, which is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, and

Z_1 and Z_2, each independently of the other, are hydrogen, lower alkyl or phenyl, and

the rings A and B, each independently of the other, are unsubstituted or substituted by halogen, nitro, cyano, lower alkyl, lower alkoxy, lower alkoxycarbonyl, amino, mono-lower alkylamino or di-lower alkylamino.

4,705,777

CATIONIC OLIGOPEPTIDES HAVING MICROBICIDAL ACTIVITY

Robert I. Lehrer, Santa Monica; Michael E. Selsted, and Tomas Ganz, both of Los Angeles, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 705,455, Feb. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 609,410, May 11, 1984, Pat. No. 4,659,692, which is a continuation-in-part of Ser. No. 443,087, Nov. 19, 1982, Pat. No. 4,543,252, which is a continuation-in-part of Ser. No. 341,394, Jan. 21, 1982, abandoned. This application Jun. 28, 1985, Ser. No. 750,378

The portion of the term of this patent subsequent to Sep. 24, 2002, has been disclaimed.

Int. Cl.[4] A61K *37/02;* C07K *7/10*

U.S. Cl. 514—12 11 Claims

1. A method for inhibiting microbial growth in an environment susceptible to said microbial growth, said method comprising:

administering to said environment a microbial growth inhibiting amount of a cationic oligopeptide of not more than about 35 amino acids having a sequence of the formula:

$$Z_{0\text{-}2}\text{—}(aa^1)_a\text{—}(aa^2)_b\text{—cys—}aa^4\text{—cys—arg—}aa^7\text{—}aa^8\text{—}aa^9\text{—cys—}$$
$$\text{—}aa^{11}\text{—}aa^{12}\text{—}aa^{13}\text{—glu—arg—}aa^{16}\text{—}aa^{17}\text{—gly—}aa^{19}\text{—cys—}$$

-continued

$$\text{—}aa^{21}\text{—}aa^{22}\text{—}aa^{23}\text{—gly—}aa^{25}\text{—}aa^{26}aa^{27}\text{—}aa^{28}\text{—}aa^{29}\text{—cys—}$$
$$\text{—cys—}(aa^{32})_c\text{—w}$$

Z is bonded to the terminal amino and may be an acyl group of from one to six carbon atoms having from zero to one amino substituent, alkyl of from one to three carbon atoms or a protective group;

a, b and c are 0 or 1;

the superscripts to the aa which defines amino acid, intends the amino acid number in the polypeptide, except where aa^9 intends two amino acids and then all subsequent numbers are increased by one, as well as the numbers in the subsequent definitions;

amino acids 1, 7, 8, 11, 13, 21, 23, 25, 26 and 28 are aliphatic amino acids;

amino acids 2, 4, 9, 12, 16, 17, 19, 22, 27, 29 and 32 are either aliphatic amino acids or aromatic amino acids; and

w is the terminal hydroxyl, amino or a peptide of from one to six amino acids having a basic amino acid at the N-terminus.

4,705,778

ORALLY ACTIVE LHRH ANALOGS

Ronald G. Almquist, Palo Alto, and Cris M. Olsen, Felton, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Oct. 22, 1985, Ser. No. 790,031

Int. Cl.[4] A61K *37/43;* C07K *7/20*

U.S. Cl. 514—15 18 Claims

1. A compound of the formula R^1-R^2-R^3-Tyr^5-R^6-R^7-Arg^8-Pro^9-KmGly^{10} wherein:

R^1 is an aminoacyl residue selected from the group consisting of: L-pGlu, D-pGlu, Ac-D-Pro, Ac-L-Pro, Ac-L-Trp, substituted D-Ala, Ac-D-Phe, Ac-p-halo-D-Phe, D-Nal, Ac-D-Nal; Gly, D-Ala, L-Ala, D-Trp, and D-Phe with and without benzoylalkanoyl, benzoyl, alkanoyl, acyl, and HOOC-$(CH_2)_n$-CO-substituents wherein n is 2–6; and Ac-p-halo-D-Pro;

R^2 is an aminoacyl residue selected from the group consisting of: L-His, halo-D-Phe, NO_2-D-Phe, dihalo-D-Phe, D-Phe, L-Phe, D-Ala, substituted D-Ala, substituted D-Phe, and diphenyl-Gly;

R^3 is an aminoacyl residue selected from the group consisting of: L-Trp, D-Trp, D-Phe, L-Phe, substituted D-Phe, substituted D-Ala, and D-Nal;

R^6 is a aminoacyl residue selected from the group consisting of: L-Gly and D-aminoacyl residues; and

R^7 is an aminoacyl residue selected from the group consisting of Leu, and N-Me-Leu.

4,705,779

PHARMACEUTICAL COMPOSITIONS OF ANTI-PANCREATIC INFLAMMATORY EFFECT

László Mádi-Szabó; Margit Morvai; Eva Horváth née Fehér, all of Budapest; Sándor Janscó, Debrecen; Piroska Tamási, Debrecen; Kovács, István, Debrecen; Kiss née Loss, Ilona Mária, Debrecen; György Bacsa, Debrecen; Mária Kubala née Papp, and Magdolna Bene née Horváth, both of Tiszavasvári, all of Hungary, assignors to Biogal Gyogyszergyar of Debrecen and Alkaloida Vegyeszeti Gyar of Tiszavasvari, Tiszavasvari, Hungary

PCT No. PCT/HU84/00016, § 371 Date Nov. 8, 1984, § 102(e) Date Nov. 8, 1984, PCT Pub. No. WO84/03442, PCT Pub. Date Sep. 13, 1984

PCT Filed Mar. 12, 1984, Ser. No. 681,887

Claims priority, application Hungary, Mar. 11, 1983, 842/83

Int. Cl.[4] A61K *31/70, 31/53, 31/22*

U.S. Cl. 514—27 5 Claims

1. A pharmaceutical composition for the treatment of in-

flammation of the pancreas which comprises a therapeutically effective amount of a combination of 3-dimethylamino-7-methyl-1,2-(n-propyl-malonyl)-1,2-dihydro-1,2,4-benzotriazine, and a second compound selected from the group consisting of 3',4',7-tris-(beta-hydroxyethyl)-rutoside, (+)-2-(3,4-dihydroxyphenyl)-3,5,7-cromanetriole, and mixtures thereof, wherein the weight ratio between the 3-dimethylamino-7-methyl-1,2-(n-propylmalonyl)-1,2-dihydro-1,2,4-benzotriazine and the second compound is 2:1 to 1:1.

4,705,780

MEDICAMENTS CONTAINING PICHIA OR EXTRACTS THEREOF

Jacqueline O. Massot, Seine-et-Marne, and Jaques N. Astoin, Paris, both of France, assignors to Univablot, Paris, France

Continuation of Ser. No. 680,579, Dec. 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 619,887, Jun. 12, 1984, abandoned, which is a continuation-in-part of Ser. No. 315,498, Oct. 27, 1981, abandoned, which is a continuation of Ser. No. 114,327, Jan. 22, 1980, abandoned. This application Jul. 24, 1986, Ser. No. 889,281

Claims priority, application France, Jan. 25, 1979, 79 01879

Int. Cl.[4] A61K *31/715*

U.S. Cl. 514—54 **7 Claims**

1. A process for treating bacterial or viral infection, comprising oral administration to a patient in need thereof of about 20–500 mg/day of a water-insoluble Pichia glucan having a molecular weight in the range of about 200,000 to 230,000, consisting essentially of branched beta (1—3) and beta (1—6)-D-glucans having one beta (1—6) bond for 9 to 10 glucose units, substantially free from: (i) proteins, lipids and mannans capable of removal by dilute alkaline treatment; and (ii) glycogens and soluble glucans capable of removal by adjusting the pH to between about 2 to 5 with a strong acid treatment.

4,705,781

METHOD OF TREATING CEREBRAL ISCHEMIA USING 4-(PHOSPHONO SUBSTITUTED LOWER ALKYL OR LOWER ALKENYL)PIPERAZINE-2-CARBOXYLIC ACIDS AND SALTS, ESTERS AND AMIDES THEREOF

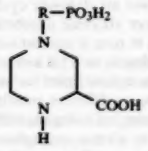
Carl A. Boast, Maplewood, N.J., assignor to Giba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 8, 1986, Ser. No. 916,967

Int. Cl.[4] A61K *31/675*

U.S. Cl. 514—85 **7 Claims**

1. A method of treating or preventing ischemic brain damage in a mammal, comprising administering to said mammal in need of the same an effective anti-ischemic amount of a compound of the formula



wherein R is lower alkylene or lower alkenylene; and the pharmaceutically acceptable salts, esters and amides thereof.

4,705,782

INDENE AND NAPHTHALENE DERIVATIVES

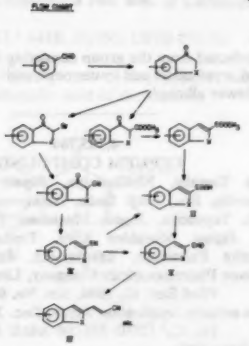
Robert T. Logan, Lanark; James Redpath, Bishopbriggs-Glasgow, and Robert G. Roy, Larkhall, all of Scotland, assignors to Akzo N.V., Arnhem, Netherlands

Filed Mar. 26, 1986, Ser. No. 844,146

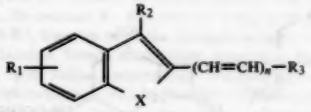
Claims priority, application United Kingdom, Apr. 2, 1985, 8508588

Int. Cl.[4] C07C *93/10, 131/00;* **A61K** *31/05, 31/155*

U.S. Cl. 514—150 **6 Claims**



1. Indene and naphthalene derivatives of the formula I



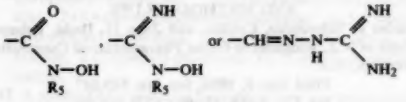
wherein

R_1 represents one up to and including four, the same or different substituents selected from alkyl (1–6 C), alkoxy (1–6 C), hydroxy, halogen, NO_2, CF_3 or the group $—NR_5R_6$, whereby two substituents taken together may also represent a methylene dioxy group,

X represents the group —CH— or $—CH_2—CH_2—$,

n has the value 0, 1 or 2,

R_3 represents one of the moieties:



and

R_2, R_4, R_5, and R_6 represent hydrogen or alkyl (1–6 C), and pharmaceutically acceptable salts thereof.

5. Pharmaceutical preparation having a positive inotropic effect comprising an effective amount of a compound according to claim 1 in admixture with a pharmaceutically acceptable carrier.

4,705,783

9α, 11β-SUBSTITUTED AND 11β-SUBSTITUTED ESTRANES

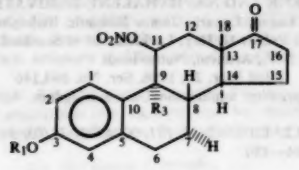
David F. Crowe, Yreka; Masato Tanabe, Palo Alto, and Richard Peters, San Jose, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Jun. 25, 1985, Ser. No. 748,489

Int. Cl.[4] A61K *31/56;* **C07J** *00/00*

U.S. Cl. 514—180 **34 Claims**

1. A compound of the formula



wherein

R_1 is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl and lower acyl; and

R_3 is lower alkoxyl.

4,705,784

CEPHEM COMPOUNDS

Hirotada Yamada, Nishinomiya, Japan; Naruhito Masai, Gainesville, Fla.; Sinji Ueda, Nishinomiya, Japan; Takao Okuda, Toyonaka, Japan; Masatomo Fukasawa, Nishinomiya, Japan; Masuhiro Kato, Toyonaka, Japan, and Masataka Fukumura, Takarazuka, Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

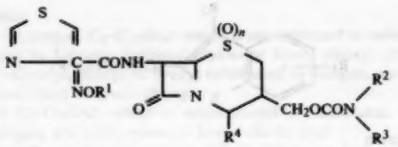
Filed Dec. 17, 1984, Ser. No. 682,283

Claims priority, application Japan, Dec. 21, 1983, 58-242904

Int. Cl.[4] C07D *501/34;* **A61K** *31/545*

U.S. Cl. 514—202 **20 Claims**

1. A cephem compound represented by the formula,



wherein, R^1 is methyl or ethyl, R^2 and R^3 are hydrogen, R^4 represents carboxyl or esterified carboxyl, and n represents 0 or 1, or a pharmaceutically acceptable salt of said cephem compound.

4,705,785

SUBSTITUTED THIACYCLOALKENO (3,2-B) PYRIDINES AND PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

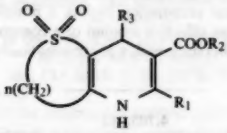
Charles F. Schwender, Califon, and John H. Dodd, Lebanon, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Apr. 9, 1986, Ser. No. 849,647

Int. Cl.[4] A61K *31/44;* **C07D** *495/04*

U.S. Cl. 514—211 **23 Claims**

1. A compound of the formula



I

wherein n is an integer from 1 to 12; R_1 is hydrogen, amino, alkyl, haloalkyl or CH_2OR_2; R_2 is straight chained or branched alkyl having 1 to 8 carbon atoms, cycloalkyl having 3 to 7 carbon atoms, or alkylene-X having at least 2 carbon atoms, wherein X is alkoxy, hydroxy, halo, p-tosyloxy, mesyloxy, amino or $—NR_4R_5$, wherein R_4 and R_5 are the same or different and are selected from hydrogen, alkyl, cycloalkyl, phenyl, benzyl, phenylethyl, or R_4, R_5 and the nitrogen atom, to which they are attached form a 5, 6 or 7 membered heterocyclic ring which optionally contains an oxygen or sulfur atom or an additional nitrogen atom, or said heterocyclic ring may be fused to a benzene ring to form an indoline, isoindoline, tetrahydroquinoline or tetrahydroisoquinoline group, and in the instance wherein said heterocyclic ring is piperazino, said piperazino may optionally be substituted in the 4-position with the substituent R_6 which is selected from alkyl, cycloalkyl, benzyl, phenyl, or phenyl substituted by alkoxy, halo, alkyl, nitro or trifluoromethyl; R_3 is 2-pyridyl, 3-pyridyl, 3-pyridyl substituted at positions 2, 4, 5 or 6 with one or more groups selected from halogen, nitro, alkoxy, alkylthio, cyano, carbalkoxy, difluoromethoxy, difluoromethylthio or alkylsulfonyl; 2-thienyl, 3-thienyl, 2,1,3-benzoxadiazolyl, 2,1,3-benzthiadiazolyl or phenyl optionally substituted at positions 2 through 6 with one or more groups selected from hydrogen, alkyl, alkoxy, cyano, carbalkoxy, alkylthio, difluoromethoxy, difluoromethylthio, alkylsulfonyl, halo, nitro or trifluoromethyl; or the pharmaceutically acceptable acid and base addition salts thereof wherein alkyl all occurrences is of one to eight carbon atoms.

4,705,786

NOVEL OXADIAZOLYL-1,4-DIHYDROPYRIDINES USEFUL AS ANTIHYPERTENSIVE AGENTS

Michihiro Yamamoto, Nishinomiya; Yukinori Ozato, Takarazuka; Nobuhiko Tamura; Akira Miyagishi, both of Toyonaka, and Youichi Hara, Ibaraki, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

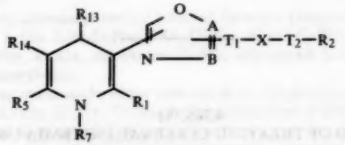
Filed Sep. 27, 1985, Ser. No. 780,974

Claims priority, application Japan, Oct. 11, 1984, 59-213786

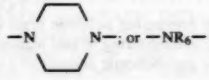
Int. Cl.[4] A61K *31/41;* **C07D** *401/04, 401/06, 413/04*

U.S. Cl. 514—252 **33 Claims**

1. A compound of the formula,



or a pharmaceutically acceptable acid addition salt thereof wherein A is nitrogen and B is CH; T_1 is lower alkylene or lower alkenylene each unsubstituted or substituted by phenylene; or T_1 is a single bond; X is



wherein

R_6 is hydrogen, lower alkyl, lower cycloalkyl or benzyl;

T_2 is carbonyl, lower alkylene unsubstituted or substituted by phenyl which in turn is unsubstituted or substituted by lower alkyl or halogen; or T_2 is a single bond; R_2 is phenyl or phenoxy each unsubstituted or substituted by one or more of the same or different substituents selected from the group consisting of halogen, trifluoromethyl, cyano, lower alkyl, lower alkoxy, methylenedioxy, lower alkylsulfonyl or hydroxy; or R_2 is pyridyl, pyrimidinyl, furyl, thienyl, lower cycloalkyl or adamantyl; or when X is $—NR_6—$, R_2 and R_6 taken together with the nitrogen to

which they are attached form pyrrolidinyl, piperidinyl or azacyclooctanyl each unsubstituted or substituted by o-phenylene which in turn is unsubstituted or substituted by phenyl, benzoyl, mono- or dihalophenyl, or mono- or dihalobenzoyl; R_{13} is phenyl unsubstituted or substituted by one or more of the same or different substituents selected from the group consisting of halogen, nitro, trifluoromethyl, cyano, lower alkyl, lower alkoxy, polyfluoro-lower alkoxy or benzyloxy; R_{14} is $COOR_8$ wherein R_8 is a saturated or unsaturated C_1–C_{10} hydrocarbon radical; or R_{14} is $—T_3R_9$ wherein T_3 is lower alkylene and R_9 is lower alkoxy, lower cycloalkyl, cyano, polyfluoro-lower alkyl or pyridyl; R_1 and R_5 are each lower alkyl or lower alkenyl; R_7 is hydrogen.

32. A pharmaceutical composition for the treatment of hypertension, which comprises as an active ingredient an antihypertensively effective amount of at least one of the compounds of claim **1**, and at least one pharmaceutically acceptable inert carrier or diluent.

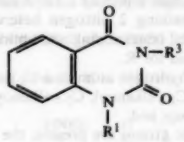
4,705,787

QUINAZOLINONE DERIVATIVES, PROCESSES FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

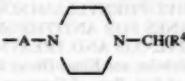
Ikuo Ueda, Uenohigashi, and Masayuki Kato, Minoo, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 622,881, Jun. 21, 1984, Pat. No. 4,608,375. This application Jun. 2, 1986, Ser. No. 869,340
Claims priority, application Japan, Jun. 27, 1983, 58-116732
Int. Cl.[4] A61K *31/445;* **C07D** *455/06*
U.S. Cl. 514—259 **4 Claims**

1. New quinazolinone derivatives of the formula:



wherein R^1 is a group of the formula:



wherein

A is lower alkylene and R^4 is aryl, and

R^3 is hydrogen or lower alkyl, and pharmaceutically acceptable salts thereof.

3. An anti-allergic pharmaceutical composition comprising an effective amount of a compound of of claim **1** or a pharmaceutically acceptable salt thereof as an effective ingredient, in association with a pharmaceutically acceptable, substantially nontoxic carrier or excipient.

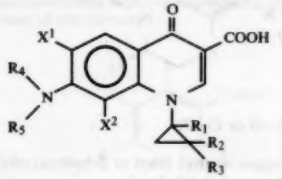
4,705,788

NOVEL ANTIBACTERIAL 7-AMINO-1(SUBSTITUTED CYCLOPROPYL)-1,4-DIHYDRO-4-OXO-3-QUINOLINECARBOXYLIC ACIDS

Michael Schriewer, Leverkusen; Klaus Grohe, Odenthal; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 27, 1986, Ser. No. 834,170
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1985, 3509546
Int. Cl.[4] A61K *31/495;* **C07D** *401/04*
U.S. Cl. 514—254 **13 Claims**

1. A 7-amino-1-(substituted cyclopropyl)-1, 4-dihydro-4-oxo-3-quinolinecarboxylic acid of the formula



in which

X^1 and X^2 can be identical of different and represent hydrogen or halogen,

R_1, R_2 and R_3 represent hydrogen, methyl, chlorine or fluorine, the radicals R_1–R_3 never all being identical, and

R_4 and R^5, together with the nitrogen atom to which they are bonded, form a morpholine, piperidine, thiomorpholine, pyrrolidine, piperazine, N-methylpiperazine, N-ethylpiperazine, N-(2-hydroxyethyl)-piperazine, n-formylpiperazine, 2-methyl-piperazine, 1,2-dimethylpiperazine, cis- and trans-2, 5-dimethylpiperazine, cis- and trans-2, 6-dimethylpiperazine, 2-ethylpiperazine, 2-propylpiperazine, 2-iosopropylpiperazine, 2-isobutylpiperazine, 2-piperazinone, 1-methyl-2-piperazinone, 1-ethyl-2-piperazinone, 2-cyclohexylpiperazine, 2-phenylpiperazine, 2-(4-chlorophenyl)-piperazine, 2-(4-fluorophenyl)piperazine, 2-(4-bromophenyl)-piperazine, 2-(4-methylphenyl)-piperazine, 2–4(biphenyl)piperazine, 2-(4-methoxophenyl)-piperazine, 2-(4-benzyloxyphenyl)-piperazine, -(4-hydroxyphenyl)-piperazine, 2-(4-nitrophenyl)-piperazine, 2-(3-nitrophenyl)-piperazine, 2-(4-piperadinophenyl)-piperazine, 2-(3,4-dimethoxyphenyl-piperazine, 2-(3,4,5-trimethoxyphenyl)-piperazine, 2-(3,4-dimethoxy-6-methyl)-piperazine, 2-(2-thienyl)-piperazine or 3-amino-pyrrolidine radical.

12. A method of combating bacteria which comprises applying to a bacteria habitat or to a patient infected by or to be protected against such bacteria an antibacterially effective amount of a compound according to claim **1**.

4,705,789

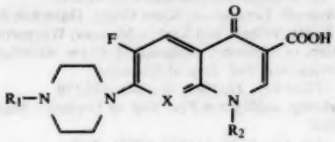
SOLUTIONS OF LACTIC ACID SALTS OF PIPERAZINYLQUINOLONE- AND PIPERAZINYL-AZAQUINOLONE-CARBOXYLIC ACIDS

Klaus Grohe, Odenthal, and Robert Lammens, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

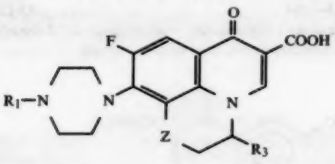
Filed Aug. 27, 1984, Ser. No. 644,834
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333719
Int. Cl.[4] A61K *31/495, 31/47*
U.S. Cl. 514—254 **7 Claims**

1. An aqueous storage stable solution which can be converted into injection or diffusion solution, comprising a solution of (a) a lactic acid salt of at least one of a piperazinylquino-

lone- and a piperazinyl containing azaquinoline-carboxylic acid of the formula I and II



(I)



(II)

in which

X denotes N, C—H or C—F,

Z denotes CH_2,

R_1 denotes hydrogen, methyl, ethyl or β-hydroxyethyl,

R_2 denotes cyclopropyl or ethyl and

R_3 denotes hydrogen, methyl or ethyl,

and (b) excess lactic acid, the excess lactic acid being present in from 0.01 to 90% of the amount based on the solution.

4,705,790

N-(2-NITROPHENYL)-4-AMINOPYRIMIDINE MICROBICIDES

Adolf Hubele, Magden, Switzerland, and Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, assignors to CIBA-GEIGY Corporation, Ardsley, N.Y.

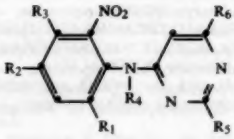
Continuation of Ser. No. 594,146, Mar. 28, 1984, abandoned. This application Sep. 25, 1985, Ser. No. 780,063

Claims priority, application Switzerland, Apr. 8, 1983, 1899/83

Int. Cl.[4] A61K *31/505;* **C07D** *239/42, 239/46*

U.S. Cl. 514—269 **16 Claims**

1. A compound of the formula I



(I)

wherein

R_1 is NO_2 or CF_3,

R_2 is NO_2 or CF_3,

R_3 is hydrogen or halogen,

R_4 is hydrogen or the —C(O)R_7 group, wherein R_7 is C_1–C_4alkyl which is unsubstituted or substituted by halogen, C_1–C_3alkoxy or C_1–C_3alkylthio,

R_5 and R_6 are each independently halogen, C_1–C_6alkoxy, C_1–C_6alkyl which is substituted by halogen or C_1–C_3alkoxy, C_1–C_6alkoxy which is substituted by halogen or C_1–C_3alkoxy, C_1–C_6alkylthio or C_1–C_6alkylthio which is substituted by halogen or C_1–C_3alkoxy, or are C_3–C_6cycloalkoxy, C_3–C_6cycloalkylthio, C_3–C_6alkenyloxy, C_3–C_6alkenylthio, C_3–C_6alkynyloxy, C_1–C_6alkylsulfoxyl, C_1–C_6-alkylsulfonyl, C_1–C_6alkylsulfonyloxy, C_3–C_6alkenylsulfoxyl, C_3–C_6alkenylsulfonyl, C_3–C_6cycloalkylsulfoxyl or C_3–C_6cycloalkylsulfonyl.

16. A method of controlling phytopathogenic micro-organisms or of preventing cultivated plants from being attacked by such micro-organisms, which comprises applying to said plants or to the locus thereof an effective amount of a compound of the formula I as defined in claim 1.

4,705,791

SUBSTITUTED PYRIMIDIN-2-ONES AND THE SALTS THEREOF

Tore Benneche, and Kjell Undheim, both of Oslo, Norway, assignors to Nyegaard & Co. A/S, Norway

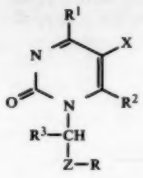
Division of Ser. No. 337,988, Jan. 8, 1982, Pat. No. 4,596,870. This application Apr. 8, 1986, Ser. No. 849,271

Claims priority, application United Kingdom, Jan. 9, 1981, 8100613

Int. Cl.[4] C07D *405/12, 409/12;* **A61K** *31/505*

U.S. Cl. 514—274 **8 Claims**

1. Compounds of the general formula



I

wherein

X represents a halogen atom or a trifluoromethyl group;

R^1 and R^2 independently represent a hydrogen atom or a C_{1-6} alkyl group;

Z represents an oxygen atom or a sulfur atom or an oxide thereof or a group $>NR^4$ wherein R^4 is as defined for R hereinafter or represents the group COR^5 in which R^5 represents a hydrogen atom or a C_{1-6} alkyl or a C_{1-6} alkoxy group optionally substituted by one or more substituents selected from halogen atoms, hydroxyl, amino, oxo, or C_{1-4} alkyl groups;

R represents a 5 or 6 membered unsaturated or aromatic heterocyclic ring containing 1 or 2 heteroatoms selected from O, N and S and optionally carrying a fused benzene ring, said heterocyclic ring optionally carrying 1 or more substituents selected from halogen atoms, C_{1-4}, alkyl, phenyl, hydroxyl, C_{1-6} alkoxy, amino, C_{1-6} alkylamino, nitro, oxo, sulfonic acid, sulfonamido and thioether groups and oxides thereof; or where Z represents a group $>NR^4$, the group ZR may represent a 5 or 6 membered heterocyclic ring containing 2 nitrogen heteroatoms optionally carrying a fused benzene ring and optionally being substituted as defined for R.

R^3 represents a hydrogen atom or a C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{1-6} alkanoyl, C_{2-6} alkenoyl, C_{7-16} aralkyl or C_{6-10} aryl group; and

where acid or basic groups are present, the salts thereof.

4,705,792

4-AMINO-2-(IMIDAZOLIDIN-2-ON-1-YL)-5-(3-TRIFLUOROMETHYL-PHENYLLAMINOCARBONYL)-PYRIMIDINES FOR ANTITHROMBOTIC PROPHYLAXIS AND TREATMENT

Ernold Granzer, Kelkheim, and Klaus-Dieter Kampe, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jun. 25, 1986, Ser. No. 878,854

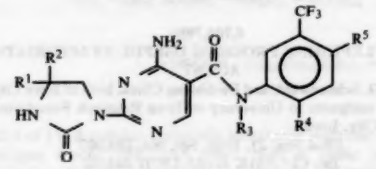
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1985, 3522940

Int. Cl.[4] C07D *239/42;* **A61K** *31/505*

U.S. Cl. 514—275 **3 Claims**

1. A method for the treatment of a warm-blooded mammal for the prophylaxis and therapy of thromboses which comprises administering to said mammal a pharmaceutically effective amount for said treatment of a 4-amino-2-(imidazolidin-

2-on-1-yl)-5-(3-trifluoromethylphenylaminocarbonyl)pyrimidine of the formula I



(I)

in which

R^1 is hydrogen, a (C_1–C_3)-alkyl group or a vinyl group,

R^2 is a methyl or ethyl group,

R^3 is hydrogen or a methyl group, and

R^4 and R^5, which are identical or different, are hydrogen, fluorine or chlorine, with the proviso that R^4 and R^5 are not both simultaneously fluorine or chlorine, that R^5 is hydrogen if R^4 is fluorine or chlorine, and that R^4 is hydrogen if R^5 is fluorine or chlorine, or a physiologicaly tolerated acid addition salt thereof.

4,705,793

PYRAZOLO[3,4-B]PYRROLO[3,4-E]PYRIDINE-5(1H)-ONE AND 1-H-PYRAZOLO[3,4-B][1,6]NAPHTHYRIDINE-5(6H)-ONE DERIVATIONS, USEFUL AS ANTI-ANXIETY AGENTS

James F. Resch, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

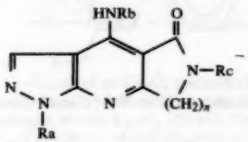
Filed Jun. 25, 1985, Ser. No. 749,142

Claims priority, application United Kingdom, Aug. 20, 1984, 8421116

Int. Cl.[4] A61K *31/395;* **C07D** *471/14*

U.S. Cl. 514—293 **6 Claims**

1. A compound of formula II as follows:



II

wherein

Ra is pent-3-ynyl or hex-4-ynyl:

Rb is hydrogen or (1–10C)alkanoyl:

Rc is (1–6C)alkyl, (3–6C)alkenyl, or (3–6C)alkynyl: and

n is 1 or 2: and the pharmaceutically-acceptable acid-addition salts thereof.

6. A method of relieving anxiety in a living mammal in need of such treatment which consists essentially of administering to said mammal an anti-anxiety effective amount of a compound of claim 1 in admixture with a pharmaceutically acceptable carrier.

4,705,794

ISCHAEMIA OR HYPOXIA CONTROLLING COMPOSITIONS CONTAINING PYRIDINECARBOXYLIC ACID ESTERS

Egbert Wehinger; Horst Meyer, both of Wuppertal, and Ulrich Benz, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,886

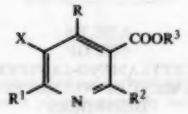
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209274

The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/455;* **C07D** *213/00, 401/04, 491/04*

U.S. Cl. 514—302 **12 Claims**

1. A composition for controlling disorders which are due to ischaemia and/or hypoxia comprising an ischaemia- and/or a hypoxia-controlling effective amount of a pyridine-carboxylic acid ester of the formula



or a pharmaceutically acceptable salt thereof, in which

R represents a phenyl radical optionally containing 1 to 2 identical or different substituents from the group consisting of halogen, cyano, trifluoromethyl, alkyl having 1 to 4 carbon atoms and alkoxy having 1 to 4 carbon atoms, or represents pyridyl,

R^1 represents alkyl having 1 to 4 carbon atoms, or hydroxyalkyl having 1 to 4 carbon atoms,

R^2 represents alkyl having 1 to 4 carbon atoms,

X represents the group —$COOR^5$,

R^5 represents a straight chain, branched or cyclic alkyl radical having up to 12 carbon atoms which is optionally interrupted by 1 oxygen atom in the chain, and

R^3 is always different from R^5 and represents alkyl with 1 to 4 carbon atoms substituted by hydroxy, alkoxy with 1 to 4 carbon atoms, cyano, halogen, trifluoromethylphenoxy, halogenphenoxy, or alkanoyloxy with 2 to 5 carbon atoms, or

R^1 and X together form a 5- to 7-membered lactone ring, and a diluent.

6. A composition for controlling disorders which are due to ischaemia and/or hypoxia comprising an ischaemia- and/or a hypoxia-controlling effective amount of a pyridinecarboxylic acid ester selected from the group consisting of

2-hydroxyethyl isopropyl 2,6-dimethyl-4-(3-nitrophenyl)-pyridine-3,5-dicarboxylate,

2-hydroxyethyl methyl 2,6-dimethyl-4-(3-nitrophenyl)pyridine-3,5-dicarboxylate,

2-cyanoethyl methyl 2,6-dimethyl-4-(3-nitrophenyl)pyridine-3,5-dicarboxylate,

methyl 2-(3-trifluoromethylphenoxy)ethyl 2,6-dimethyl-4-(3-nitrophenyl)pyridine-3,5-dicarboxylate,

2-hydroxyethyl 5,7-dihydro-2-methyl-4-(3-nitrophenyl)-5-oxofuro[3,4-b]pyridine-3-carboxylate,

or a pharmaceutically acceptable salt thereof and a diluent.

4,705,795

(2,4,6-TRIMETHOXYPHENYL)-(3-PIPERIDINO-PROPYL)-KETONE DERIVATIVES

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, Maisons-Alfort, France

Continuation of Ser. No. 545,174, Oct. 25, 1983, abandoned. This application Feb. 14, 1986, Ser. No. 829,565

Claims priority, application France, Oct. 26, 1982, 82 17938

Int. Cl.[4] C07D *211/32;* **A61K** *31/445*

U.S. Cl. 514—317 **6 Claims**

1. A (2,4,6-trimethoxyphenyl)-(3-piperidinopropyl)-ketone

compound selected from the group consisting of (2,4,6-trimethoxyphenyl)-[3-(2-methylpiperidino)-propyl]ketone, (2,4,6-trimethoxyphenyl)-[3-(3-methylpiperidino)propyl]-ketone, (2,4,6-trimethoxyphenyl)-[3-(2-ethylpiperidino)-propyl]-ketone, (2,4,6-trimethoxyphenyl)-[3-(3,5-dimethylpiperidino)-propyl]-ketone, (2,4,6-trimethoxyphenyl)-[3-(2,6-dimethylpiperidino)-propyl]-ketone, and non-toxic acid addition salts thereof.

3. A method of treating a circulation disorder in a mammal comprising administering to said mammal an effective blood circulation enhancing amount of a compound selected from the group consisting of (2,4,6-trimethoxyphenyl)-[3-(2-methylpiperidino)-propyl]-ketone, (2,4,6-trimethoxyphenyl)-[3-(3-methylpiperidino)-propyl]-ketone, (2,4,6-trimethoxyphenyl)-[3-(2-ethylpiperidino)-propyl]-ketone, (2,4,6-trimethoxyphenyl)-[3-(3,5-dimethylpiperidino)-propyl]-ketone, (2,4,6-trimethoxyphenyl)-[3-(2,6-dimethylpiperidino)propyl]-ketone, and non-toxic acid addition salts thereof.

4,705,796

USE OF 3-N-PHENYLACETYLAMINO-2,6-PIPERIDINEDIONE FOR TREATMENT OF NEUROPSYCHIATRIC DISORDERS

Lawrence B. Hendry; Ana H. Diamond; Bruce I. Diamond, and Douglas E. Ewing, all of Augusta, Ga., assignors to Stereochemical Genetics, Inc., Augusta, Ga.

Filed Aug. 25, 1986, Ser. No. 899,822

Int. Cl.[4] A61K *31/445*

U.S. Cl. 514—328 **3 Claims**

1. A method of inhibiting monoamine oxidase type B activity in a mammalian host affected by neuropsychiatric disorders comprising administering internally to said host an effective monoamine oxidase inhibiting amount of 3-N-phenylacetylamino-2,6-piperidinedione or pharmaceutically effective salts thereof.

4,705,797

N-(3,3-DIPHENYLPROPYL) AMINOETHYL ESTERS OF 1,4-DIHYDRO-2,6-DIMETHYL-PYRIDINE-3,5-DICARBOXYLIC ACID, COMPOSITIONS AND USE

Dante Nardi; Amedeo Leonardi, both of Milan; Gabriele Graziani, Arese, and Giorgio Bianchi, Milan, all of Italy, assignors to Recordati S.A., Chemical and Pharmaceutical Company, Chiasso, Switzerland

Filed Feb. 14, 1985, Ser. No. 701,672

Claims priority, application United Kingdom, Feb. 14, 1984, 8403866

Int. Cl.[4] A61K *31/455*; C07D *211/90, 413/04*

U.S. Cl. 514—356 **8 Claims**

1. Methyl N-(3,3-diphenylpropyl)-N-methyl-2-aminoethyl 1,4-dihydro-2,6-dimethyl-4-(benzofurazan-4-yl)-pyridine-3,5-dicarboxylate, or a stereoisomer or pharmaceutically acceptable acid addition salt thereof.

5. A pharmaceutical composition of matter for use as an antihypertensive or as a coronary dilator comprising an antihypertensive or coronary dilating amount of a member selected from the group consisting of

methyl N-(3,3-diphenylpropyl)-N-methyl-2-aminoethyl 1,4-dihydro-2,6-dimethyl-4-(benzofurazan-4-yl)-pyridine-3,5-dicarboxylate;

methyl N-(3,3-diphenylpropyl)-N-hydroxy-2-aminoethyl 1,4-dihydro-2,6-dimethyl-4-(3-nitrophenyl)-pyridine-3,5-dicarboxylate;

methyl 1,1,N-trimethyl-N-(3,3-diphenylpropyl)-2-aminoethyl 1,4-dihydro-2,6-dimethyl-4-(3 -nitrophenyl)-pyridine-3,5-dicarboxylate; and

2-propoxy-1,1-dimethylethyl 1,1,N-trimethyl-N-(3,3-diphenylpropyl)-2-aminoethyl 1,4-dihydro-2,6-dimethyl-4-(3-nitrophenyl)-pyridine-3,5-dicarboxylate;

or a stereoisomer or pharmaceutically acceptable acid addition salt thereof, and a pharmaceutically acceptable diluent or carrier therefor.

4,705,798

PHENYLEPHRINE PRODRUG USEFUL AS MYDRIATIC AGENT

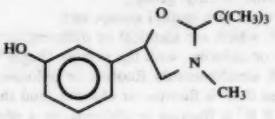
Ronald D. Schoenwald, and Du-Shieng Chien, both of Iowa City, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Filed Sep. 27, 1985, Ser. No. 780,907

Int. Cl.[4] A61K *31/42*; C07D *263/02*

U.S. Cl. 514—374 **12 Claims**

1. A compound of the formula:



and the non-toxic pharmaceutically acceptable salt forms thereof.

12. A method of topically treating the eye to produce a mydriatic effect comprising:

applying directly to the cornea a small but mydriatically effective amount of the compound of the formula 2-t-butyl-3-methyl-5-(m-hydroxyphenyl)-1,3-oxazolidine, said compound being suspended in a non-toxic, non-eye irritating oil suspension.

4,705,799

AMINOMETHYL OXOOXAZOLIDINYL BENZENES USEFUL AS ANTIBACTERIAL AGENTS

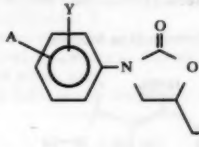
Walter A. Gregory, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 676,745, Dec. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 578,332, Feb. 14, 1984, abandoned, which is a continuation-in-part of Ser. No. 501,897, Jun. 7, 1983, abandoned. This application Dec. 2, 1985, Ser. No. 803,191

Int. Cl.[4] A61K *31/42*; C07D *263/22*

U.S. Cl. 514—376 **100 Claims**

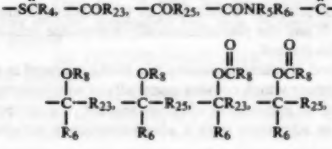
1. A compound of the formula



(I)

wherein, for the l, and mixtures of the d and l stereoisomers of the compound,

A is $-NO_2$, $-S(O)_nR_1$, $-S(O)_2-N{=}S(O)_pR_2R_3$, $-SH$,



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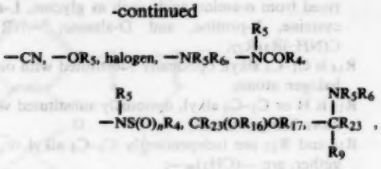
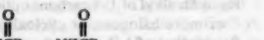


alkyl of 1 to 8 carbons, optionally substituted with one or more halogen atoms, OH, =O other than at alpha position, $S(O)_nR_{24}$, NR_5R_6, alkenyl of 2–5 carbons, alkynyl of 2–5 carbons or cycloalkyl of 3–8 carbons;

R_1 is C_1–C_4 alkyl, optionally substituted with one or more halogen atoms, OH, CN, NR_5R_6 or CO_2R_8; C_2–C_4 alkenyl; $—NR_9R_{10}$; $—N_3$;



$—NX_2$; NR_9X $—^-NXZ^+$;

R_2 and R_3 are independently C_1–C_2 alkyl or, taken together are $—(CH_2)_q—$;

R_4 is alkyl of 1–4 carbons, optionally substituted with one or more halogens;

R_5 and R_6 are independently H, alkyl of 1–4 carbons or cycloalkyl of 3–8 carbons;

R_7 is $—NR_5R_6$, $—OR_5$ or

R_8 is H or alkyl of 1–4 carbons;

R_9 is H, C_1–C_4 alkyl or C_3–C_8 cycloalkyl;

R_{10} is H, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_3–C_4 cycloalkyl, $—OR_8$ or $—NR_{11}R_{11A}$;

R_{11} and R_{11A} are independently H or C_1–C_4 alkyl, or taken together, are $—(CH_2)_r—$;

X is Cl, Br or I;

Y is H, F, Cl, Br, alkyl of 1–3 carbons, or NO_2, or A and Y taken together can be $—O—(CH_2)_t—O—$;

Z is a physiologically acceptable cation;

n is 0, 1 or 2;

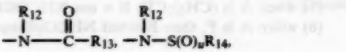
p is 0 or 1;

q is 3, 4 or 5;

r is 4 or 5;

t is 1, 2 or 3;

B is $—NH_2$,



or N_3;

R_{12} is H, C_1–C_{10} alkyl or C_3–C_8 cycloalkyl;

R_{13} is H; C_1–C_4 alkyl optionally substituted with one or more halogen atoms; C_2–C_4 alkenyl; C_3–C_4 cycloalkyl; phenyl; $—CH_2OR_{15}$; $—CH(OR_{16})OR_{17}$; $—CH_2S(O)_nR_{14}$;

$—OR_{18}$; $—SR_{14}$; $—CH_2N_3$; the aminoalkyl groups derived from α-amino acids such as glycine, L-alanine, L-cysteine, L-proline, and D-alanine; $—NR_{19}R_{20}$; or $C(NH_2)R_{21}R_{22}$;

R_{14} is C_1–C_4 alkyl, optionally substituted with one or more halogen atoms;

R_{15} is H or C_1–C_4 alkyl, optionally substituted with one or more halogen atoms;

R_{16} and R_{17} are independently C_1–C_4 alkyl or, taken together, are $—(CH_2)_m—$;

R_{18} is C_1–C_4 alkyl or C_7–C_{11} aralkyl;

R_{19} and R_{20} are independently H or C_1–C_2 alkyl;

R_{21} and R_{22} are independently H, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, phenyl or, taken together, are $—(CH_2)_s—$;

u is 1 or 2;

v is 0, 1 or 2;

m is 2 or 3;

s is 2, 3, 4 or 5; and

R_{23} is H, alkyl of 1–8 carbons optionally substituted with one or more halogens, or cycloalkyl of 3–8 carbons;

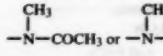
R_{24} is alkyl of 1–4 carbons or cycloalkyl of 3–8 carbons;

R_{25} is alkyl of 1–4 carbons substituted with one or more of $—S(O)_nR_{24}$, $—OR_8$,

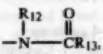
$—NR_5R_6$, or alkenyl of 2–5 carbons optionally substituted with CHO; or a pharmaceutically suitable salt thereof; provided that:

(1) when A is $CH_3S—$, then B is not

(2) when A is $CH_3SO_2—$, then B is not



(3) when A is $H_2NSO_2—$ and B is



then R_{12} is H;

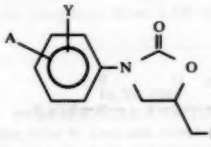
(4) when A is —CN, B is not $—N_3$;

(5) when A is $(CH_3)_2CH$, B is not $NHCOCH_2Cl$;

(6) when A is OR_5, then B is not NH_2;

(7) when A is F, then B is not $NHCO_2CH_3$.

69. A method for alleviating bacterial infection in a mammal which comprises administering to the mammal an antibacterially effective amount of at least one compound having the formula:



(I)

wherein, for the l, and mixtures of the d and l stereoisomers of the compound,

A is $—NO_2$, $—S(O)_nR_1$, $—S(O)_2—N{=}S(O)_pR_2R_3$, —SH,

A is $—NO_2$, $—S(O)_nR_1$, $—S(O)_2—N{=}S(O)_pR_2R_3$, —SH,

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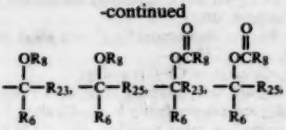
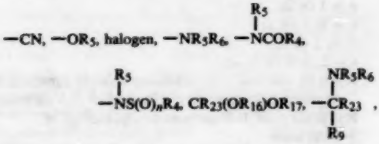
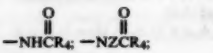




alkyl of 1 to 8 carbons, optionally substituted with one or more halogen atoms, OH, =O other than at alpha position, $S(O)_nR_{24}$, NR_5R_6, alkenyl of 2–5 carbons, alkynyl of 2–5 carbons or cycloalkyl of 3–8 carbons;

R_1 is C_1–C_4 alkyl, optionally substituted with one or more halogen atoms, OH, CN, NR_5R_6 or CO_2R_8; C_2–C_4 alkenyl; $-NR_9R_{10}$; $-N_3$;



$-NX_2$; $NR_9X-{}^-NXZ^+$;

R_2 and R_3 are independently C_1–C_2 alkyl or, taken together are $-(CH_2)_q-$;

R_4 is alkyl of 1–4 carbons, optionally substituted with one or more halogens;

R_5 and R_6 are independently H, alkyl of 1–4 carbons or cycloalkyl of 3–8 carbons;

R_7 is $-NR_5R_6$, $-OR_5$ or

R_8 is H or alkyl of 1–4 carbons;

R_9 is H, C_1–C_4 alkyl or C_3–C_8 cycloalkyl;

R_{10} is H, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_3–C_4 cycloalkyl, $-OR_8$ or $-NR_{11}R_{11A}$;

R_{11} and R_{11A} are independently H or C_1–C_4 alkyl, or taken together, are $-(CH_2)_r-$;

X is Cl, Br or I;

Y is H, F, Cl, Br, alkyl of 1–3 carbons, or NO_2, or A and Y taken together can be $-O-(CH_2)_rO-$;

Z is a physiologically acceptable cation;

n is 0, 1 or 2;

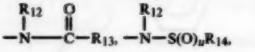
p is 0 or 1;

q is 3, 4 or 5;

r is 4 or 5;

t is 1, 2 or 3;

B is $-NH_2$,



or N_3;

R_{12} is H, C_1–C_{10} alkyl or C_3–C_8 cycloalkyl;

R_{13} is H; C_1–C_4 alkyl optionally subsituted with one or more halogen atoms; C_2–C_4 alkenyl; C_3–C_4 cycloalkyl; phenyl; $-CH_2OR_{15}$; $-CH(OR_{16})OR_{17}$; $-CH_2S(O)_vR_{14}$;

$-OR_{18}$; $-SR_{14}$; $-CH_2N_3$; the aminoalkyl groups derived from α-amino acids such as glycine, L-alanine, L-cysteine, L-proline, and D-alanine; $-NR_{19}R_{20}$; or $C(NH_2)R_{21}R_{22}$;

R_{14} is C_1–C_4 alkyl, optionally substituted with one or more halogen atoms;

R_{15} is H or C_1–C_4 alkyl, optionally substituted with one or more halogen atoms;

R_{16} and R_{17} are independently C_1–C_4 alkyl or, taken together, are $-(CH_2)_m-$;

R_{18} is C_1–C_4 alkyl or C_7–C_{11} aralkyl;

R_{19} and R_{20} are independently H or C_1–C_2 alkyl;

R_{21} and R_{22} are independently H, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, phenyl or, taken together, are $-(CH_2)_s-$;

u is 1 or 2;

v is 0, 1 or 2;

m is 2 or 3;

s is 2, 3, 4 or 5; and

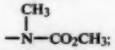
R_{23} is H, alkyl of 1–8 carbons optionally substituted with one or more halogens, or cycloalkyl of 3–8 carbons;

R_{24} is alkyl of 1–4 carbons or cycloalkyl of 3–8 carbons;

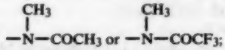
R_{25} is alkyl of 1–4 carbons substituted with one or more of $-S(O)_nR_{24}$, $-OR_8$,

$-NR_5R_6$, or alkenyl of 2–5 carbons optionally substituted with CHO; or a pharmaceutically suitable salt thereof; provided that:

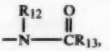
(1) when A is CH_3S-, then B is not



(2) when A is CH_3SO_2-, then B is not



(3) when A is H_2NSO_2- and B is



then R_{12} is H;

(4) when A is —CN, B is not $-N_3$;

(5) when A is $(CH_3)_2CH$, B is not $NHCOCH_2Cl$;

(6) when A is F, then B is not $NHCO_2CH_3$.

4,705,800

DIFLUORBENZODIOXYL CYANOPYRROLE MICROBICIDAL COMPOSITIONS

Robert Nyfeler, Basel, and Josef Ehrenfreund, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

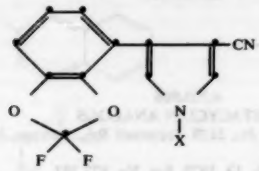
Filed Jun. 13, 1986, Ser. No. 874,193

Claims priority, application Switzerland, Jun. 21, 1985, 2649/85

Int. Cl.[4] C07D *317/46*; A01N *43/30*

U.S. Cl. 514—422 **11 Claims**

1. A compound of formula I



wherein X has the following meanings:

A: hydrogen or CO—R_1, wherein R_1 is C_1–C_6alkyl which is unsubstituted or substituted by halogen or C_1–C_3alkoxy; or is C_3–C_6alkenyl, C_3–C_6alkynyl, or C_1–C_6alkoxy which is unsubstituted or substituted by halogen or C_1–C_3alkoxy; or is C_3–C_6alkenyloxy, or C_3–C_6cycloalkyl;

B: S—R_2, wherein R_2 is C_1–C_3haloalkyl;

C: CH(Y)R_3, wherein R_3 is hydrogen or C_1–C_8haloalkyl and Y is hydroxy, halogen or OC(O)R_4, wherein R_4 is C_1–C_8alkyl, C_1–C_8haloalkyl, C_2–C_6alkenyl, or C_1–C_6alkoxycarbonyl; or

D: CH_2—Z, wherein Z is the group

in which formula each of R_5 and R_6 independently of the other is hydrogen, C_1–C_6alkyl which is unsubstituted or substituted by cyano or C_1–C_6alkoxycarbonyl; or is C_3–C_6alkenyl, C_3–C_6alkynyl, C_3–C_7cycloalkyl, or phenyl which is unsubstituted or substituted by halogen, C_1–C_6alkyl, C_1–C_6haloalkyl or C_1–C_6alkoxy, with the proviso that only R_5 or R_6 may be hydrogen.

9. A method of controlling phytopathogenic microorganisms or of protecting cultivated plants from attack by said microorganisms, which method comprises applying to said plants, to parts of plants or to the locus thereof a compound of formula I according to claim 1.

4,705,801

PRODUCTION FOR PRODUCING 3-CYANO-4-PHENYL INDOLES AND INTERMEDIATES

Pierre Martin, Rheinfelden, and Robert W. Lang, Pratteln, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

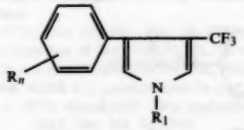
Filed Oct. 7, 1985, Ser. No. 784,984

Claims priority, application Switzerland, Oct. 16, 1984, 4950/84

Int. Cl.[4] A01N *43/36;* **C07D** *207/33, 207/34;* **C07B** *43/08*

U.S. Cl. 514—423 **4 Claims**

1. The compound of the formula



wherein

R is halogen, C_1–C_6-alkyl or C_1–C_6-haloalkyl,

n is 0, 1 or 2, and

R_1 is hydrogen or the group C(O)R_2, in which R_2 is C_1–C_6-alkyl, C_1–C_6-haloalkyl, phenyl or C_1–C_6-alkoxy.

4. A process for controlling fungi which damage plants, which process comprises applying to the plants or to the locus thereof a fungicidally effective amount of a compound of claim 1.

4,705,802

OMEGA-ARYL-ALKYLTHIENYL-COMPOUNDS AND PROCESS FOR THE TREATMENT OF CHRONICALLY INFLAMMATORY PROCESSES IN HUMANS

Hans-Heiner Lautenschläger; Michael J. Parnham; Sigurd Leyck, all of Pulheim; Johannes Winkelmann, Cologne, and Axel Brekle, Bielefeld, all of Fed. Rep. of Germany, assignors to A. Nattermann & CIE GmbH, Cologne, Fed. Rep. of Germany

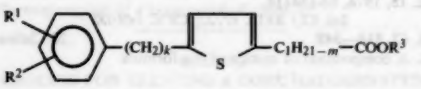
Filed Feb. 26, 1985, Ser. No. 705,671

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1984, 3407510

Int. Cl.[4] A61K *31/38;* **C07D** *333/12*

U.S. Cl. 514—438 **3 Claims**

1. An ω-aryl-alkylthienyl compound having the formula I



I

wherein k is an integer from 3 to 10, l is an integer from 4 to 10, m is zero or 2, R^1 is a member selected from the group consisting of hydrogen, fluorine, chlorine, bromine, C_{1-4}-alkyl, trifluoromethyl, hydroxyl, C_{1-4}-alkoxy, amino, C_{1-4}-alkylamino, di-C_{1-4}-alkylamino, C_{1-4}-acylamino and nitro, R^2 is a member selected from the group consisting of hydrogen, fluorine, chlorine, bromine, C_{1-4}-alkyl, trifluorometyl, hydroxyl, C_{1-4}-alkoxy, amino, C_{1-4}-alkylamino, di-C_{1-4}-alkylamino, C_{1-4}-acylamino and nitro, and R^3 is a member selected from the group consisting of hydrogen, the alkali metal ions, the straight-chain and the branched alkyl groups with 1 to 6 carbon atoms and the benzyl group.

4,705,803

METHOD OF IMPROVING RESORPTION OF INJECTED ANTIBACTERIALLY ACTIVE SUBSTANCES OR COMBINATIONS

Otto Kern; Franz Wilhelm, and Ernst Salamon, all of Ingelheim am Rhein, Fed. Rep. of Germany, assignors to Boehringer Ingelheim Vetmedica GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 471,299, Mar. 2, 1983, abandoned. This application Feb. 3, 1986, Ser. No. 825,785

Claims priority, application Japan, Jul. 31, 1982, 57-133871

Int. Cl.[4] A61K *31/335, 31/135*

U.S. Cl. 514—450 **4 Claims**

1. A method of increasing the resorption of tylosin in an animal host, which comprises parenterally administering to said host (a) N-(2-amino-3,5-dibromo-benzyl)-N-methyl-cyclohexlamine in combination with (b) an effective antibacterial amount of tylosin, the weight ratio of component (a) to component (b) being from about 2:100 to 12:100.

4,705,804

DIARRHEAL ANTITOXIN

W. Blair Geho; John R. Lau, and Joseph Jacob, all of Wooster, Ohio, assignors to Technology Unlimited, Inc., Wooster, Ohio

Filed May 6, 1985, Ser. No. 730,830

Int. Cl.[4] A61K *31/34, 9/70, 9/42*

U.S. Cl. 514—474 **1 Claim**

1. The method of eliminating diarrhea caused by the toxins produced by *V.Cholera* or *E. Coli* by the oral administration of an antitoxin effective amount of ascorbic acid or ascorbyl palmitate whereby ascorbic acid or ascorbyl palmitate is present throughout the lumen of the small and large intestine in a detoxifying amount without killing said organisms.

4,705,805

ANTITHROMBOTIC AGENT

Koji Yamada; Tamotsu Hashimoto, both of 1188 Shimotogari, Nagaizumi-cho, Sunto-gun, Shizuoka-ken; Masao Naruse, 870-51, Kamitsuchidana, Ayase-shi, Kanagawa-ken; Yo Murayama, 4-17-6, Nakazato, Minami-ku, Yokohama-shi, Kanagawa-ken, and Hideki Ninno, 376, Kumizawa-cho, Totsuka-ku, Yokohama-shi, Kanagawa-ken, all of Japan

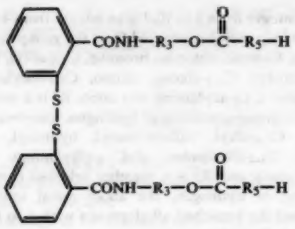
Continuation of Ser. No. 776,088, Sep. 13, 1985, abandoned, which is a continuation of Ser. No. 660,558, Oct. 15, 1984, abandoned, which is a continuation of Ser. No. 563,536, Dec. 20, 1983, abandoned, which is a continuation of Ser. No. 307,181, Sep. 30, 1981, abandoned, which is a continuation of Ser. No. 48,518, Jun. 14, 1979, abandoned. This application Feb. 17, 1987, Ser. No. 16,473

Claims priority, application Japan, Jun. 16, 1978, 53-72965; Dec. 15, 1978, 53-154114

Int. Cl.[4] A61K *31/22*; C07C *149/00*

U.S. Cl. 514—548 20 Claims

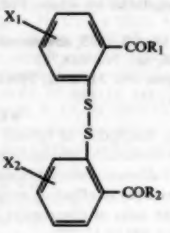
1. A composition of matter of the formula



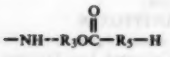
wherein R_3 represents a straight or branched alkylene group having 1 to 5 carbon atoms and R_5 represents a straight or branched alkylene group having 1 to 18 carbon atoms.

9. 2,2'-dithiobis(N-2-hydroxypropylbenzamide).

10. An antithrombotic pharmaceutical composition in a form for administration orally or by injection which comprises an effective antithrombotic amount of a compound represented by the formula



wherein X_1 and X_2 are hydrogen; R_1 and R_2 represent an acyloxyalkylamino group represented by the formula



wherein R_3 represents a straight or branched alkylene group having 1 to 5 carbon atoms and R_5 represents a straight or branched alkylene group having 1 to 18 carbon atoms; or a pharmaceutically acceptable salt thereof and at least one compound for formulation selected from the group consisting of pharmaceutically acceptable excipients, disintegrators, binders, lubricants, pigments, vehicles and diluents.

11. An antithrombotic pharmaceutical composition, comprising an effective antithrombotic amount of 2,2'-dithiobis(N-2-hydroxypropylbenzamide) and a pharmacologically accepatable carrier.

4,705,806

PROSTACYCLIN ANALOGS

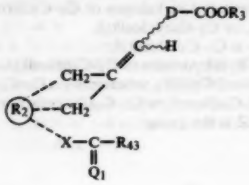
Douglas R. Morton, Jr., 3128 Tattersall Rd., Portage, Mich. 49002

Filed Feb. 13, 1978, Ser. No. 877,253

Int. Cl.[4] C07C *177/00*; A01K *31/557*

U.S. Cl. 514—530 86 Claims

1. A compound of the formula



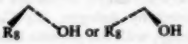
wherein D is

(1) $-(CH_2)_d-$ wherein d is one to 5, inclusive,

(2) $-(CH_2)_d-CF_2-$, wherein d is one to 5, inclusive

(3) $-(CH_2)_k-CH=CH-$ wherein k is one or 2,

wherein Q_1 is



wherein R_8 is hydrogen or methyl;

wherein R_3 is

(a) hydrogen

(b) alkyl of one to 12 carbon atoms, inclusive,

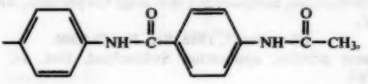
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,

(d) aralkyl of 7 to 12 carbon atoms, inclusive,

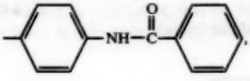
(e) phenyl,

(f) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,

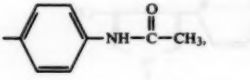
(g)



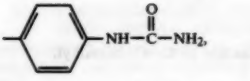
(h)



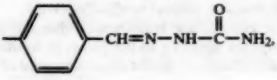
(i)



(j)



(k)



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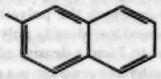
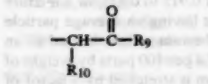
(l)



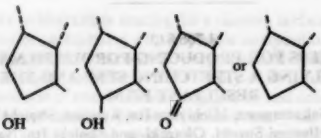
(m)



wherein R_9 is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, and wherein R_{10} is hydrogen or benzoyl, or

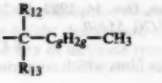
(n) a pharmacologically acceptable cation;

wherein R_2 is



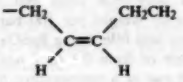
wherein R_{43} is

(l)



wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $—CR_{12}R_{13}—$ and terminal methyl, wherein R_{12} and R_{13} are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_{12} and R_{13} is fluoro only when the other is hydrogen or fluoro; or

(2)



wherein X is trans—CH=CH—, cis—CH=CH—, or $—CH_2CH_2—$; and wherein ~ indicates attachment in alpha or beta configuration.

4,705,807

AMINE DERIVATIVES

David C. Horwell, Farnborough, and Graham H. Timms, Mytchett, both of England, assignors to Lilly Industries Limited, London, England

Continuation of Ser. No. 277,541, Jun. 26, 1981, abandoned, which is a continuation of Ser. No. 93,701, Nov. 13, 1979, abandoned, which is a continuation of Ser. No. 943,083, Sep. 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 683,873, May 6, 1976, abandoned. This application Dec. 10, 1982, Ser. No. 448,549

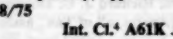
Claims priority, application United Kingdom, May 8, 1975, 19348/75

Int. Cl.[4] A61K *31/455*; C07C *87/28*

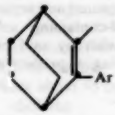
U.S. Cl. 514—650 **9 Claims**

1. An amine of formula (I):

(I)



or a pharmaceutically-acceptable acid-addition salt thereof, wherein n is an integer from 1 to 3; R^1 is C_1-C_3 alkyl; R^2 is hydrogen or C_1-3 alkyl; and R is a 2-phenylbicyclo group of formula:



and Ar is selected from the group consisting of phenyl, p-halophenyl or 3,4-dihalophenyl.

3. A method of treating a mammal suffering from, or susceptible to, a disorder of the central nervous system, which comprises administering to said mammal a chemotherapeutically effective amount of a compound of claim 1.

4,705,808

PROCESS FOR TREATING A CORE HALOGENATED STRONGLY ACIDIC CATION EXCHANGE CATALYST

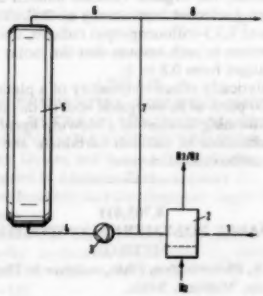
Gunter Brandes, Seevetal; Wilhelm Neier, and Werner Webers, both of Rheinberg, all of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Mar. 27, 1986, Ser. No. 844,653

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1985, 3512517

Int. Cl.[4] C08F *5/20, 6/00*

U.S. Cl. 521—30 **7 Claims**



1. A process for the pretreatment of a core halogenated and sulfonated strongly acidic cation exchange styrene-divinyl benzene resin catalyst which comprises treating said catalyst with deionized water maintained in the liquid phase and at a temperature in the range of 100° to about 150° C., said treatment being conducted in the absence of oxygen and metal ions.

4,705,809

PROCESS FOR PREPARING A POROUS POLYMER ARTICLE

Gaylon L. Dighton, and Donald W. Pennington, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 7, 1986, Ser. No. 882,335

Int. Cl.[4] C08J *9/26*

U.S. Cl. 521—62 **41 Claims**

1. A process for preparing a porous thermoplastic polymer article having a predetermined degree of porosity, which process consists of the steps of

(a) admixing a water soluble cellulosic compound of predetermined particle size and a polyolefin thermoplastic compound which is insoluble in water;

(b) forming the admixture into the shape desired for said

article under conditions sufficient to form a continuous phase of said thermoplastic compound and a non-continuous phase of said cellulosic compound; and

(c) contacting said admixture with water to solubilize a major portion of said cellulosic compound and separating the aqueous cellulosic compound-containing solution from the thermoplastic polymer whereby said porous thermoplastic polymer article having a predetermined degree of porosity is produced.

4,705,810

BLOWING AGENT ADMIXTURE FOR FOAMABLE ORGANOPOLYSILOXANE COMPOSITIONS

Claude Millet, Saint-Priest, and Paul Rostaing, Vienne, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jan. 20, 1987, Ser. No. 4,479

Claims priority, application France, Jan. 21, 1986, 86 00977

Int. Cl.[4] C08J *9/08*

U.S. Cl. 521—86 **9 Claims**

1. A foamable organopolysiloxane composition of matter, comprising:

(A) 100 parts of at least one diorganopolysiloxane oil blocked at each end of its polymer chain by a vinyldiorganosiloxy unit in which the organic radicals bonded to the silicon atom are selected from among methyl, ethyl, n-propyl, vinyl, phenyl and 3,3,3-trifluoropropyl radicals, having a viscosity of 100 to 300,000 mPa.s at 25° C.;

(B) At least one organohydropolysiloxane selected from among oily and liquid resinous homopolymers and copolymers, containing at least three SiH groups per molecule and a single hydrogen atom bonded to the same silicon atom, the organic radicals bonded to the silicon atoms being selected from among methyl, ethyl, n-propyl, phenyl and 3,3,3-trifluoropropyl radicals, said siloxane (B) being present in such amount that the molar ratio SiH/vinyl-Si ranges from 0.8 to 8;

(C) A catalytically effective quantity of a platinum catalyst;

(D) 0 to 200 parts of an inorganic and/or metallic filler; and

(E) A cell forming amount of a blowing agent which comprises admixture of calcium carbonate and at least one organic carboxylic acid.

4,705,811

EXPANDABLE POLYMERIC COMPOSITION AND METHOD

Chung P. Park, Pickerington, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 835,133, Apr. 7, 1986, Pat. No. 4,661,302. This application Mar. 9, 1987, Ser. No. 940,124

Int. Cl.[4] C08J *9/14, 9/22*

U.S. Cl. 521—88 **6 Claims**

1. An expandable polymeric composition comprising: (a) at least 50% by weight of an alkenyl aromatic polymer; (b) a volatile blowing agent; and (c) from about 0.06% to about 15.0% by weight of an expansion aid comprising polyphenylene ether.

4,705,812

PROCESS FOR PRODUCING POROUS FILMS INVOLVING A STRETCHING STEP AND THE RESULTANT PRODUCT

Keiko Ito, Nakatsugawa; Michiyasu Ito, Kuwana; Shoichi Tsuji, Nagoya, and Hisatosi Suzuki, Okazaki, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Japan

Filed Dec. 14, 1984, Ser. No. 681,914

Claims priority, application Japan, Mar. 5, 1984, 59-40440; Mar. 22, 1984, 59-53576; Mar. 22, 1984, 59-53577

Int. Cl.[4] B29C *67/20, 55/10*

U.S. Cl. 521—92 **10 Claims**

1. In a process for producing porous films which comprises melting a resin composition consisting essentially of a polyethylene resin and a filler noncompatiable therewith, and with or without a hydrocarbon-free lubricant, forming the molten resin composition into a film and then stretching the film at least uniaxially, the improvement in which the polyethylene resin is either a high-pressure-processed low-density polyethylene resin having a melt index of 0.5 to 7 and a density of 0.915 to 0.935, a linear low-density polyethylene resin having a melt index of 0.5 to 8.5 and a density of 0.915 to 0.935, or a mixture thereof; the filler is barium sulfate having an average particle diameter of 0.1 to 7μm and the barium sulfate is used in an amount of 50 to 500 parts by weight per 100 parts by weight of the polyethylene resin; and the film is stretched by a factor of 1.5 to 7.

9. A porous film having water resistance, moisture permeability and gas permeability which has been produced by a process as claimed in any one of claims 1 and 2 to 8.

10. The porous film, according to claim 9, wherein said film is a fluid-impereable sheet for diapers or sanitary napkins.

4,705,813

PROCESS FOR PRODUCING POROUS FILMS INVOLVING A STRETCHING STEP AND THE RESULTANT FILM

Keiko Ito, Nakatsugawa; Michiyasu Ito, Kuwana; Shoichi Tsuji, Nagoya; Hisatosi Suzuki, Okazaki, and Shoichi Ito, Nagoya, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Japan

Filed Dec. 14, 1984, Ser. No. 681,946

Claims priority, application Japan, Dec. 16, 1983, 58-236333

Int. Cl.[4] B29C *67/20, 55/10*

U.S. Cl. 521—92 **6 Claims**

1. A process for producing porous films which comprises the steps of:

(a) melting a resin composition consisting essentially of a polyolefin resin selected from the group consisting of polypropylene, high-density polyethylene, ethylene-propylene copolymer, polybutylene, ethylene-butylene copolymer, ethylene vinyl acetate copolymer, and blends thereof, or a blend of the polyolefin resin with low-density polyethylene of linear low-density polyethylene, with or without a hydrocarbon-free lubricant, and a filler that is non-compatible with said polyolefin resin and in an amount of 50 to 500 parts by weight per 100 parts by weight of said plyolefin resin, said filler being $BaSO_4$ with an average particle diameter of from 0.1 to 7 μm, said melting step being carried out at a temperature higher than the melting point of said polyolefin resin, but lower than the decomposition temperature thereof;

(b) forming the thus melted resin composition into a film; and

(c) stretching the thus formed film at least uniaxially by a factor of 1.5 to 7.

5. A porous film having water resistance, mositure permeability and gas permeability which is produced by a process as claimed in any one of claims 1, 2, 3, and 4.

6. The porous film according to claim 5, wherein said film is fluid-impermeable sheet for diapers or sanitary napkins.

4,705,814

REACTION PRODUCT OF POLYOXYALKYLENE POLYAMINE AND AN ALIPHATIC ISOCYANATE

Robert A. Grigsby, Jr., Georgetown; Richard J. G. Dominguez, and George P. Speranza, both of Austin, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 6, 1986, Ser. No. 927,475

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—159 **7 Claims**

1. A reaction product of a polyoxyalkylene polyamine and an aliphatic isocyanate wherein the polyoxyalkylene polyamine is present in less than the stoichiometric amount.

4,705,815

ANTIREVERSE RUNNING-SURFACE TREATMENT FOR CROSS-COUNTRY SKIS

Rémi Longeray, Grigny; Pierre Lanteri, Villeurbanne; Thomas Mathia, Marcy L'Etoile; Francois Jodelet, Voiron, and Serge Segura, Lyons, all of France, assignors to Skis Rossignol SA, Voiron, France

Filed Sep. 12, 1986, Ser. No. 907,070
Claims priority, application France, Sep. 30, 1985, 85 14974
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—160 **20 Claims**

1. An antibackslide coating for a running surface of a cross-country ski, comprising a hydrophobic composition with abrasion resistance and viscoelastic properties such that the composition is highly sensitive to the velocity of its deformation and the direction of attack of snow engaged by said coating so that, during a propulsion phase of cross-country ski action, the coating permits some penetration of snow crystals into the coating while, during a gliding phase, the coating has enhanced elasticity ensuring rapid disengagement of such crystals whatever the temperature and nature of these crystals, said coating having a topography defined by crests of different heights and a crest-height distribution compatible with the granulometry of a variety of different types of snow.

4,705,816

LIQUID MULCH

Ernest G. Pole, and David Carnell, both of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Continuation of Ser. No. 652,528, Sep. 20, 1984, abandoned. This application Apr. 16, 1986, Ser. No. 854,726
Int. Cl.[4] C09K *17/00, 17/02*
U.S. Cl. 523—132 **4 Claims**

1. A liquid agricultural mulch having a solids content from 50 to 85 percent by weight of:

(A) per 100 parts by dry weight of a latex of a polymer having a Tg of less than 20° C. said polymer selected from the group consisting of:

(a) polymers of: from 20 to 80 weight percent of a C_{4-6} conjugated diolefin, from 80 to 20 weight percent of a mixture comprising:

from about 100 to 60 weight percent of C_{8-13} vinyl aromatic monomer which may be unsubstituted or substitued by a C_{1-4} alkyl radical or a chlorine or bromine atom; and up to 40 weight percent of a C_{3-9} alkenyl nitrile;

and optionally from about 0.5 to 10 weight percent of one or more monomers selected from the group consisting of:

(i) C_{3-9} ethylenically unsaturated carboxylic acid or C_{1-8} alkly or C_{1-8} alkanol esters thereof;

(ii) C_{3-9} ethylenically unsaturated aldehydes

(iii) amides of C_{3-9} ethylenically unsaturated acids which may be unsubstituted or substituted at the nitrogen atom by up to two C_{1-4} alkyl or C_{1-4} alkanol radicals;

(b) polymers of: from about 1 to 40 weight percent of at least one C_{2-4} mono olefin;

from about 99 to 60 weight percent of an alkenyl or alkenol ester of a C_{1-8} saturated carboxylic acid;

and optionally from about 0.5 to 10 weight percent of one or more monomers selected from the group consisting of:

(i) C_{3-9} ethylenically unsaturated carboxylic acid or C_{1-8} alkyl or C_{1-8} alkanol esters thereof:

(ii) C_{3-9} ethylenically unsaturated aldehydes

(iii) amides of C_{3-9} ethylenically unsaturated acids which may be unsubstituted or substituted at the nitrogen atom by up to two C_{1-4} alkyl or C_{1-4} alkanol radicals:

(c) polymers of: from about 5 to 35 weight percent of a C_{2-8} alkenyl nitrile;

from about 95 to 65 weight percent of a C_{4-6} conjugated diolefin;

and optionally from about 0.5 to 10 weight percent of one or more monomers selected from the group consisting of:

(i) C_{3-9} ethylenically unsaturated carboxylic acid or C_{1-8} alkyl or C_{1-8} alkanol esters thereof:

(ii) C_{3-9} ethylenically unsaturated aldehydes

(iii) amides of C_{3-9} ethylenically unsaturated acids which may be unsubstituted or substituted at the nitrogen atom by up to two C_{1-4} alkyl or C_{1-4} alkanol radicals.

(B) from about 300 to about 800 parts by weight of one or more fine particulate fillers selected from group consisting of calcium carbonate, clay, stone dust, limestone, carbon black, micaflakes, and slated lime;

(C) from about 0.5 to 10 parts by weight percent of a surfactant;

(D) optionally up to about 5 parts by weight of a dispersing agent;

(E) optionally up to about 10 parts by weight of one or more members selected from the group consisting of fertilizers, herbicides, fungicides, insectides, nematicides, trace minerals, and organic biostimulants; and

(F) sufficient thickening agent to provide a viscosity of about 1000 cps.

4,705,817

METHOD OF PREVENTING THE RUST-FORMING AND ADHERENCE BETWEEN FRICTION MATERIAL AND OPPOSITE FRICTION MEMBER

Kazuo Tsugawa, Gyoda, and Susuma Wada, Tatebayashi, both of Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo and Akebono Research and Development Centre Ltd., Hanyu, both of, Japan

Filed Oct. 21, 1986, Ser. No. 921,199
Claims priority, application Japan, Oct. 31, 1985, 60-244766
Int. Cl.[4] C08J *5/14;* C08K *3/22, 3/38*
U.S. Cl. 523—152 **2 Claims**

1. A method of preventing the rust-forming and adherence between friction material and opposite friction member characterized in incorporating into the friction material a mixture or reaction product of boric acid and zinc oxide wherein said boric acid and zinc oxide are present in a weight ratio of 1:10 to 10:1 as an additive in an amount of 0.5 to 20 wt.%.

4,705,818

POLYPROPYLENE-BASE RESIN COMPOSITION

Yoichi Kawai; Masaru Abe; Akio Yoshihara; Shigeru Hayashi, and Katsumi Sekiguchi, all of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Mar. 28, 1986, Ser. No. 845,506
Claims priority, application Japan, Apr. 9, 1985, 60-73465
Int. Cl.[4] C08K *9/04, 3/34, 3/26, 3/06*
U.S. Cl. 523—200 **9 Claims**

1. A polypropylene resin composition obtained by heating at a temperature of 170° to 280° C. a mixture comprising:

(a) crystalline ethylene-propylend block complymer having an ethylene content of 7 to 30 weight percent and having a portion of 65 weight percent or more insoluble in boiling n-heptain;

(b) an ethylene-propylene copolymer rubber having an ethylene content of 10 to 34 weight percent and a Mooney viscosity $ML1_{+4}$ of 15 to 80 at 100° C.;

(c) an inorganic filler having a particle size 6 μm or smaller; and

(d) an organic peroxide,

said components (a), (b), (c) and (d) being present in amounts of 65 to 95 weight percent, 35 to 5 weight percent, 2 to 25 weight percent and 0.001 to 0.5 weight percent, respectively, all of which are based on the total amount of components (a) and (b).

4,705,819

PROCESS FOR PREPARING RUBBER COMPOSITIONS

Richard M. Scriver, Luxembourg, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 11, 1985, Ser. No. 710,784

Int. Cl.[4] C08K *3/04*; C08J *3/20*

U.S. Cl. 523—351 **5 Claims**

1. A process for preparing a rubber composition, where the rubber consists essentially of cis 1,4-polyisoprene and polybutadiene, which comprises:

(A) 100 parts by weight of rubber comprising 80 to 90 parts by weight of cis 1–4 polyisoprene and 10 to 20 parts by weight polybutadiene rubber,

(B) 40–70 parts by weight of carbon black and

(C) rubber vulcanization aid including accelerators and sulfur, and other processing additives,

the process comprising mechanically mixing the composition under shear conditions in at least two consecutive stages, where in the first stage all the carbon black is mixed with at least 50 parts by weight of the cis 1–4 polyisoprene and the said number of parts of polyisoprene does not exceed more than 80% of the total polyisoprene content of the rubber, and in the second stage the remaining cis 1–4 polyisoprene, alone or as a pre-blend with said polybutadiene rubber, is mixed into the composition.

4,705,820

SURGICAL SUTURE COATING

David W. Wang, Vestal, N.Y.; Donald J. Casey, Ridgefield, and Leonard T. Lehmann, Danbury, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sep. 5, 1986, Ser. No. 903,791

Int. Cl.[4] C08L *67/04*

U.S. Cl. 524—381 **11 Claims**

1. A suture coating comprising a random copolymer having about 25 to 75 weight percent of glycolic acid ester linkages and the remaining linkages comprising trimethylene carbonate, said copolymer having a glass transition temperature at or below ambient temperature.

4,705,821

ANTICORROSIVE METAL SURFACE TREATING COMPOSITION

Takeyasu Ito, Chiba, and Teruaki Kuwajima, Higashiosaka, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 499,426, May 31, 1983. This application May 8, 1985, Ser. No. 731,951

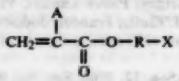
Claims priority, application Japan, May 31, 1982, 57-92663; Apr. 26, 1983, 58-74247

The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

Int. Cl.[4] C08J *3/24*

U.S. Cl. 524—407 **4 Claims**

1. A metal surface treating composition having improved anticorrosive, bending and scratch resistant properties consisting essentially of an aqueous emulsion of hard polymer microparticles obtained by emulsion polymerization of α, β-ethylenically unsaturated monomers in the presence of an emulsifier in an amount, on the solid basis, of 5 to 100 parts by weight per 100 parts by weight of said monomers, said emulsifier being selected from the group consisting of polyacrylic acid, a copolymer of acrylic acid with at least one member selected from the group consisting of methacrylic acid, an acrylamide, a methacrylamide or a hydrophilic monomer of the formula:



in which A stands for a hydrogen atom or a methyl group, R represents a substituted or unsubstituted alkene having 2 to 4 carbon atoms, and X is a functional group containing at least one of oxygen, phosphorous and sulfur atoms, and mixtures of said acrylic acid and copolymer, wherein said α, β-ethylenically unsaturated monomers to be polymerized are selected from the group consisting of acrylic esters, methacrylic esters, acrylonitrile, methacrylonitrile, vinyl acetate, vinyl chloride, vinyl ketones, vinyl toluene, styrene, acrylamides, methacrylamides and the hydrophilic monomers of the formula above; the polymer microparticles having a means diameter of 0.1 to 3μ and being hardened by using as a part of said α,β-ethylenically unsaturated monomers, either a monomer having in its molecule two and more ethylenical unssaturation bondings capable of entering into a radical polymerization, thereby causing inner gelation of the polymer, or by using appropriate monomers capable of bringing the glass transition tempertaure of the polymer from 15° to 110° C., and a water soluble chromium compound in which 25 to 50% by weight of the chromium atoms are trivalent, the weight ratio of emulsion solid to metal chromium being 1:10 to 5:1.

4,705,822

ORDERED, ALTERNATING SULFONE POLYCARBONATE COMPOSITION

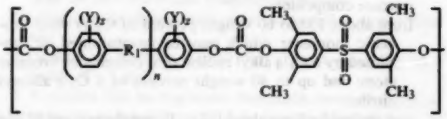
James H. Kawakami; James E. Harris, both of Piscataway; Louis M. Maresca, Belle Mead; Lloyd M. Robeson, Whitehouse Station, and Robert J. Cotter, Bernardsville, all of N.J., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 591,539, Mar. 20, 1984, Pat. No. 4,594,404. This application Jun. 10, 1986, Ser. No. 872,275

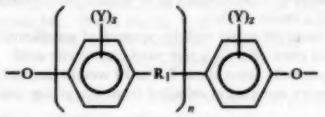
Int. Cl.[4] C08G *63/62*; C08L *69/00*

U.S. Cl. 524—425 **9 Claims**

1. A composition comprising: (a) a polycarbonate containing ordered, alternating repeating units having the formula:

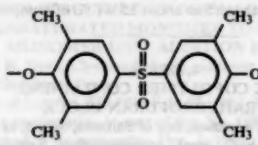


in an amount sufficient to enhance hydrolytic stability of the polycarbonate, wherein Y is selected from alkyl groups of 1 to 4 carbon atoms, chlorine or bromine, each z, independently, has a value of from 0 to 4 inclusive, n has a value of 0 or 1, R_1 is a direct bond or R_1 is a divalent saturated or unsaturated hydrocarbon radical, O, CO, SO_2, or S, with the proviso that when R_1 is SO_2 then the subunit having the formula



(I)

is not the same as the subunit having the formula



(II)

and wherein the polycarbonate has a reduced viscosity of at least about 0.3 dl/g as measured in chloroform at a concentration of 0.5 g/100 ml at 25° C.; and (b) a polymer having mechanical compatibility with the polycarbonate.

4,705,823

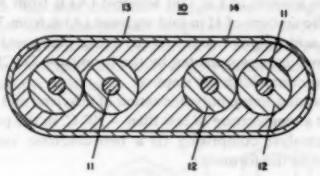
EXTRUDABLE BLEND

Jae H. Choi, Warren Township, Marion County, Ind.; William M. Kanotz, Baldwin, and William C. Vesperman, Bel Air, both of Md., assignors to AT&T Technologies, Berkeley Heights and AT&T Bell Laboratories, Murray Hill, both of, N.J.

Division of Ser. No. 822,331, Jan. 24, 1986, Pat. No. 4,656,091, which is a division of Ser. No. 666,640, Oct. 31, 1984, Pat. No. 4,592,955. This application Nov. 7, 1986, Ser. No. 928,083

Int. Cl.[4] C08J *5/02*

U.S. Cl. 524—474 **7 Claims**



1. An extrudable composition of matter comprising a polymer blend consisting essentially of a styrene-ethylenebutylene-styrene copolymer with a mixture of low melt index and high melt index polypropylenes wherein the chainlength of the styrene portion of the copolymer exceeds the chainlength of the ethylenebutylene portion and wherein the copolymer comprises >10 to <20 weight parts of the blend, the low melt index polypropylene comprises >10 to <20 weight parts of the blend and the high melt index polypropylene comprises from >50 to <80 weight parts of the blend.

4,705,824

POLY(5-IMIDAZOLONE) AND PROCESS THEREFOR

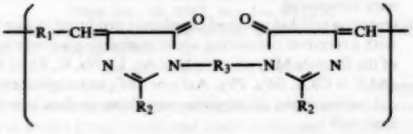
Shiow C. Lin, Ellicott City, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Feb. 14, 1986, Ser. No. 829,331

Int. Cl.[4] C08G *73/06*

U.S. Cl. 524—612 **11 Claims**

1. A poly(5-imidazolone) having recurring structural units selected from the formula group consisting of:



wherein R_1, R_2 and R_3 are each independent organic moieties.

4,705,825

POLYMERIC PRODUCTS AND THEIR PRODUCTION

Kenneth C. Symes, Keighley; John Langley, Shipley, and Kishor K. Mistry, Bradford, all of England, assignors to Allied Colloids Limited, Bradford, England

PCT No. PCT/GB85/00287, § 371 Date Feb. 4, 1986, § 102(e) Date Feb. 4, 1986, PCT Pub. No. WO86/00315, PCT Pub. Date Jan. 16, 1986

PCT Filed Jun. 28, 1985, Ser. No. 827,960

Claims priority, application United Kingdom, Jun. 28, 1984, 8416455

Int. Cl.[4] C08J *3/02*; C08G *83/00*

U.S. Cl. 524—732 **19 Claims**

1. A process of making a substantially homogeneous polymeric product comprising gelatinised polysaccharide units and units of polymerised water soluble ethylenically unsaturated monomer or monomer blend by heating a dispersion of particulate ungelatinised polysaccharide in aqueous monomer containing polymerisation initiator to a temperature above the gelatinisation temperature of the polysaccharide and thereby gelatinising the polysaccharide and gel polymerising the polymer, in which the dispersion comprises 10 to 50% by weight monomer, 3 to 60% by weight polysaccharide and 25 to 75% by weight water and the amount of monomer in the dispersion is 0.3 to 10 parts by part by weight polysaccharide and the product is a water soluble or swellable powder, the monomer undergoes exothermic polymerisation during the process and part at least of the heating is provided by the polymerisation exotherm, the polymerisation and gelatinisation results in the production of a comminutable gel, the gel is comminuted and the comminuted gel is dried to form the powder.

4,705,826

PROCESS FOR THE PREPARATION OF POLY(DIORGANOSILOXANES) WITH ALKOXY END GROUPS

Wilhelm Weber, Cologne; Karl H. Sockel; Theo Achtenberg, both of Leverkusen, and Hans Sattlegger, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

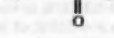
Filed Jun. 11, 1986, Ser. No. 872,989

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1985, 3523206

Int. Cl.[4] C08L *83/04*

U.S. Cl. 524—860 **12 Claims**

1. A process for the preparation of a triorganooxysilyl- or a diorganooxyorganosilyl-terminated poly(diorganosiloxane) of a formulation containing such siloxane comprising reacting a α,ω-dihydroxypoly(diorganosiloxane) with a tetraorganooxysilane or triorganooxyorganosilane in the presence of an ammonium carbamate catalyst of the formula (I)



(I)

wherein R represents a hydrocarbon radical with 1 to 20 C atoms or an H atom, and where identical or different R radicals are in the molecule.

4,705,827

RESIN COMPOSITION COMPRISING UNSATURATED DICARBOXYLIC ACID ANHYDRIDE POLYMER, POLYCARBONATE RESIN AND MODIFIED OLEFIN POLYMER

Mikio Kodama, Hirakata; Akitoshi Ito, Nabari; Motoichi Yano, Settsu; Takayoshi Fujiwara, Osaka, and Satoshi Umeyama, Amagasaki, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Osaka, Japan

Filed Mar. 28, 1986, Ser. No. 845,722

Claims priority, application Japan, Mar. 29, 1985, 60-68138; May 16, 1985, 60-104557; May 17, 1985, 60-106572; May 22, 1985, 60-110990

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 14 Claims

1. A thermoplastic resin composition which comprises:

(A) an unsaturated dicarboxylic acid anhydride polymer produced by polymerization of (a-1) at least one unsaturated dicarboxylic acid anhydride and (a-2) at least one of aromatic vinyl compounds, unsaturated nitrile compounds and unsaturated carboxylic acid esters,

(B) a polycarbonate resin, and

(C) at least one modified olefin polymer selected from the group consisting of (C-I) an olefin/alkyl unsaturated carboxylate copolymer, (C-II) an unsaturated carboxylic acid-modified olefin polymer and (C-III) an epoxy group-containing olefin polymer.

4,705,828

POLYPROPYLENE RESIN COMPOSITION AND BIAXIALLY STRETCHED FILM THEREOF

Yoshio Matsumoto; Toshio Fujii; Yoshinao Shinohara, and Kiyoshi Fukuda, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Feb. 6, 1986, Ser. No. 826,591

Claims priority, application Japan, Feb. 6, 1985, 60-21043

Int. Cl.[4] C08L *23/12, 9/00, 11/00*

U.S. Cl. 525—232 17 Claims

1. A polypropylene resin composition, consisting essentially of:

(a) 100 parts by weight of a propylene homopolymer showing a stereoregularity of a boiling heptane-insoluble portion thereof of not less than 0.960 as an isotactic pentad rate obtained by ^{13}C-NMR, and

(b) 0.01–2 parts by weight of a hydrocarbon polymer having a completely or partially saturated main hydrocarbon chain and at least one hydroxy group at the end of the hydrocarbon chain, said hydrocarbon polymer being a conjugated diene homopolymer or copolymer prepared by anionically or radically polymerizing the reacting monomers followed by at least partial hydrogenation or prepared by cationically polymerizing the reacting monomers followed by oxidation of the polymer obtained.

4,705,829

LOW DENSITY POLYETHYLENE RESIN COMPOSITIONS AND THERMOPLASTIC FILMS THEREOF

Tae H. Kwack, Fairport, N.Y., and Tien-Kuei Su, Belle Mead, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 11, 1986, Ser. No. 851,016

Int. Cl.[4] C08L *23/18, 23/20, 23/08*

U.S. Cl. 525—240 10 Claims

1. A thermoplastic resin blend which provides enhanced processability and improved output without loss of overall film properties comprising a terblend of linear low density polyethylene resins consisting essentially of three distinct and different resins selected from (1) an LLDPE having a low MI of from about 0.4 to about 5 and a low MFR of less than about 50; (2) an LLDPE having a high MFR of from about 50 to about 100 and a low MI of from about 0.4 to about 5; and (3) an LLDPE having a high MI of 25 or greater and a low MFR of less than about 50, said terblend comprising from about 45 to about 90 wt % of component (1), from about 5 to about 45% of component (2) and from about 5 to about 15 wt % of component (3).

4,705,830

BLOCK COPOLYMER CONTAINING TETRAHYDROFURAN BLOCK

Tokuo Makishima, deceased, late of Saitama, Japan, by Nobuko Makishima, Tokyo, legal representative; Satoshi Ueki, Saitama; Chihiro Imai, Kanagawa, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

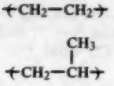
Filed May 24, 1985, Ser. No. 738,068

Claims priority, application Japan, May 29, 1984, 59-107616

Int. Cl.[4] C08F *295/00*

U.S. Cl. 525—333.4 6 Claims

1. A process for producing a block copolymer having a number-average molecular weight of about 1,000 to about 1,000,000 in which a random copolymer segment (A) is bonded to a polymer segment (B), with the ratio of (A) to (B) being 5/95 to 95/5 by weight, said random copolymer segment (A) being composed of the constitutional units represented by the formulas I and II below

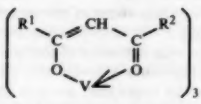


I

II

wherein the amount of I in said segment (A) is from 30 to 80 wt% and the amount of II in said segment (A) is from 70 to 20 wt%, and said polymer segment (B) being composed of the constitutional units represented by the formula $—O.(CH_2)_4—$, said process comprising the steps of:

(a) performing living polymerization of ethylene and propylene at a temperature of less than −50° C. in the presence of a catalyst comprising (i) a beta-diketone vanadium chelate of the formula



wherein R^1 and R^2 are the same or different and are each alkyl or aryl and (ii) an organoaluminum compound of the formula R_2AlX, wherein R is an alkyl group of 1 to 8 carbon atoms and X is a halogen atom, to provide a living ethylene-propylene random copolymer having an ethylene-to-propylene ratio of from 30/70 to 80/20 by weight, said vanadium chelate being used in an amount of from 1×10^{-4} to 0.01 mol per 1 mol of said ethylene and propylene, said organoaluminum compound being used in an amount of from about 1×10^{-3} to 0.1 mol per 1 mol of said ethylene and propylene, and said organoaluminum compound being used in an amount of from 5 to 25 mol per 1 mol of said vanadium chelate;

(b) reacting said ethylene-propylene copolymer with a halogen selected from chlorine, bromine and iodine to provide an ethylene-propylene random copolymer having halogenated terminal groups, said halogen being employed in an amount of from 2 to 5 moles per mole of said organoaluminum compound;

(c) reacting said halogenated copolymer produced in step (b) with a terminal converting agent comprising a compound of the formula MY, wherein M is Ag, Li, Na, K, Rb or Cs, and Y is ClO_4, BF_4, PF_6, AsF_6 or SbF_6 to provide terminal carbocations of ethylene-propylene random copolymer; and

(d) polymerizing the product of step (c) with tetrahydrofuran to form said block copolymer.

4,705,831

SHAPED STRUCTURE OF POLYAMIDE TREATED WITH UNSATURATED MONOMER TO EFFECT SINGLE MONOMER UNIT ADDITION BRANCH

Michael E. Dyer, Cleveland, Tenn., assignor to Intera Corporation, Cleveland, Tenn.

Division of Ser. No. 579,801, Feb. 17, 1984, Pat. No. 4,563,507, which is a continuation-in-part of Ser. No. 128,062, Mar. 7, 1980, abandoned. This application Dec. 2, 1985, Ser. No. 803,233

Int. Cl.[4] C08G *69/48*

U.S. Cl. 525—426 5 Claims

1. A shaped structure of solid, high molecular weight polyamide polymer which has been treated with an ethylenically unsaturated monomer to effect the addition of the monomer pendant to the polymer chains to form a branched polymer with substantially no graft polymerization of said monomer to said polymer.

4,705,832

INJECTION MOLDABLE AMIDE-IMIDE COPOLYMERS CONTAINING POLYETHERIMIDES

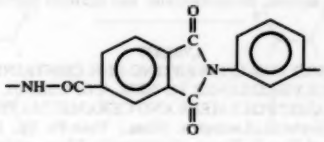
Gary T. Brooks, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 727,274, Apr. 25, 1985, abandoned, which is a continuation-in-part of Ser. No. 576,136, Jan. 31, 1984, abandoned. This application Jul. 3, 1986, Ser. No. 881,931

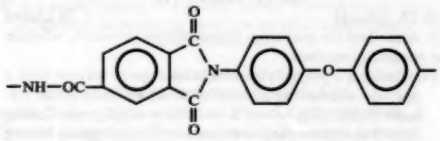
Int. Cl.[4] C08L *77/06*

U.S. Cl. 525—436 4 Claims

1. An injection moldable composition having improved toughness when annealed at temperatures up to 500° F. comprising about 10 to about 30 percent by weight of a polyetherimide melt compounded with a polyamide-imide copolymer comprising A units of:



and B units of:



wherein the molar ratio of A units/B units is about 30/70.

4,705,833

THERMOSETTABLE HEAT-RESISTANT RESIN COMPOSITIONS

Yasuhisa Saito, Osaka; Hisao Takagishi, Kyoto; Katsuya Watanabe, Osaka; Kohichi Okuno, Osaka; Junichi Kenmei, Hyogo, and Kunimasa Kamio, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

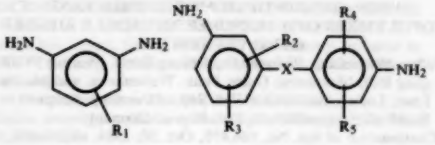
Filed Dec. 24, 1985, Ser. No. 813,272

Claims priority, application Japan, Jan. 17, 1985, 60-7017; Mar. 23, 1985, 60-58966

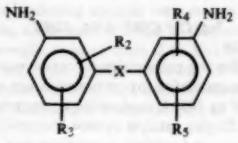
Int. Cl.[4] C08G *59/44, 59/54*

U.S. Cl. 525—504 6 Claims

1. A thermosettable heat-resistant resin composition containing an amino group-terminated imide compound (A) produced by imidating at least one of the aromatic diamines represented by the formulae (I), (II) and (III),

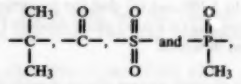


(I) (II)



(III)

wherein R_1, R_2, R_3, $R_4$and R_5independently represent a hydrogen or halogen atom, or a C_1 –C_5 alkyl, C_1–C_3 alkoxy or hydroxyl group, and X represents a divalent group selected from the group consisting of —CH_2—, —O—, —S—,



with an aromatic tetracarboxylic anhydride at a diamine:anhydride molar ratio of from 1.2:1 to 4:1, and an epoxy resin (B) having at least two epoxy groups in the molecule, the molar ratio of the amino group of the imide compound (A) to the epoxy group of the epoxy resin (B) being 1:1.6 to 1:2.6.

4,705,834

CROSSLINKED OXYALKYLATED POLYALKYLENEPOLYAMINES

Richard Baur, Dannstadt-Schauernheim; Knut Oppenlaender, Ludwigshafen, and Klaus Barthold, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 24, 1984, Ser. No. 685,256

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1983, 3347257

Int. Cl.[4] C08F *283/00*

U.S. Cl. 525—540 4 Claims

1. A crosslinked oxyalkylated polyalkylenpolyamine which is obtained by reacting a polyalkylenepolyamine, which is completely oxyalkylated at the nitrogen atoms, in each case by from 10 to 300 groups, and possesses from 50 to 2,000 repeating alkyleneimine units in the molecule, with from 0.5 to 10% by weight, based on the oxyalkylated polyalkylenepolyamine, of a crosslinking compound which possesses two or more functional groups which are capable of reacting with the terminal alcohol groups of the oxyalkylated polyalkylenepolyamine.

4,705,835

PREPARATION OF HOMOPOLYMERS AND COPOLYMERS OF α-MONOLEFINS USING A ZIEGLER CATALYST SYSTEM

Volker Warzelhan, Weisenheim; Robert Bachl, Worms; Wolfgang Ball, Mannheim; Guido Funk, Weisenheim, and Martin Laun, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 666,475, Oct. 30, 1984, abandoned. This application Jun. 18, 1986, Ser. No. 876,298

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404668

Int. Cl.[4] C08F *4/64, 10/02*

U.S. Cl. 526—116 **2 Claims**

1. A process for the preparation of copolymers of ethylene with C_3–C_8-α-monoolefins by polymerization of the monomers at from 50° to 125° C. and under a pressure of from 5 to 60 bar, using a Ziegler catalyst system comprising

(1) a transition metal catalyst component and

(2) an organoaluminum catalyst component of the formula

$$AlR_3$$

where R is C_2–C_8-alkyl, with the provisos (i) that the atomic ratio of the transition metal from the catalyst component (1) to aluminum from catalyst component (2) is from 1:0.2 to 1:200 and (ii) that the transition metal catalyst component (1) is a solid-phase product (VI), obtained by a method in which

(1.1) first

(1.1.1) a finely divided, porous silicon dioxide (I), which has a particle diameter of from 1 to 400 μm, a pore volume of from 1 to 2.5 cm^3/g and a specific surface area of from 200 to 400 m^2/g and

(1.1.2) a solution (II), as obtained on combining

(IIa) 100 parts by weight of an organic solvent and

(IIb) from 1 to 30 parts by weight of a transition metal composition, are brought into contact with one another to form a suspension (III), with the proviso that the weight ratio of silicon dioxide (I) to transition metal composition (IIb) is from 1:0.2 to 1:1.5, the suspension (III) is evaporated to dryness at below 160° C. and above the melting point of the organic solvent (IIa) used, a solid-phase intermediate (IV) being formed, and

(1.2) thereafter

(1.2.1) the solid-phase intermediate (IV) obtained from stage (1.1) and

(1.2.2) a solution, in an organic solvent, of an aluminum compound (V) of the formula

$$AlR_mX_{3-m}$$

where X is chlorine, R is C_2–C_8-alkyl, and m is the number 2, are brought into contact with one another to form a suspension, with the proviso that the weight ratio of the solid-phase intermediate (IV) to the aluminum compound (V) is from 1:0.1 to 1:1, and the resulting suspended solid-phase product (VI) is the transition metal catalyst component (1), the improvement which comprises employing as the transition metal catalyst component (1) a solid-phase product (VI) obtained using a solution (II) consisting of

(IIa) a saturated alicylic oxahydrocarbon of 1 oxa oxygen atom and 4–6 carbon atoms as the organic solvent, and

(IIb) a mixture of

(IIb1) 100 molar parts of a vanadium trihalide/alcohol complex of the formula $VY_3.nZ\text{-}OH$, where Y is chlorine, n is from 1–6 and Z is an alkyl of not more than 4 carbon atoms,

(IIb2) from 0.5 to 100 molar parts of a titanium trichloride and (IIb3) from 3 to 200 molar parts of a zirconium tetrachloride as the transition metal composition.

4,705,836

POLYMERIZATION COMPOSITION CONTAINING VINYL BENZOIC ACID OR A DERIVATIVE THEREOF AND A VINYL COMPOUND

Masasuke Ohtsuka, Tokyo; Yoshinori Harada, Urawa; Shigeo Tokita, Chiba, and Hideyo Maniwa, Kanagawa, all of Japan, assignors to Nippon Shiken Dental Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1985, Ser. No. 794,140

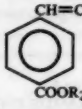
Claims priority, application Japan, Jul. 8, 1985, 60-148422

Int. Cl.[4] C08F *220/00, 220/18;* **A61K** *6/08*

U.S. Cl. 526—318.1 **22 Claims**

1. A dental bonding composition consisting essentially of:

(A) Compounds of general formula



wherein R_1 comprises hydrogen or a methyl group and R_2 comprises hydrogen, an alkyl group with 1–5 carbon atoms which may be substituted with halogen, an alkyleneoxide group with 2–4 carbon atoms which may be substituted with halogen, or an $-(CH_2CH_2O)_nH$ group wherein n is an integer of from 1–4 wherein the carbon atoms may be substituted with eighter halogen or a methyl group; and

(B) a vinyl compound selected from the group consisting of methylmethacrylate ester, polyethylene glycol dimethacrylate, 2-hydroxy ethyl methacrylate, tetrahydro furfuryl methacrylate, 2,2-bis[4-(2-methacryloxyethoxy)phenyl]-propane, acrylonitril, vinyl acetate, 2-cyano acryl acid ester, styrene, divinylbenzene, and mixtures thereof.

4,705,837

METHOD FOR CONVERTING SI-H CONTAINING POLYSILOXANES TO NEW AND USEFUL PRECERAMIC POLYMERS AND CERAMIC MATERIALS

Dietmar Seyferth, Lexington, Mass.; Yuan-Fu Yu, Dayton, Ohio, and Tom S. Targos, Sommerville, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 8, 1986, Ser. No. 849,390

Int. Cl.[4] C08G *77/12*

U.S. Cl. 528—31 **30 Claims**

1. A method for preparing organosilicon polymers, wherein the method comprises:

(a) admixing a poly(silylamide) in an organic solvent with a polysiloxane having a plurality of repeat units of the formula $[RSi(H)O]_n$ where R is a lower alkyl group having from 1 to about 6 carbon atoms, a cycloalkyl group having 3 to about 6 carbon atoms, a substituted or unsubstituted lower aryl group having from 6 to about 10 carbon atoms, and n is an integer 1 or greater; and

(b) allowing the admixture of step (a) to react.

4,705,838

ACCELERATION OF RATE OF CURE IN BORON TRIFLUORIDE AMINE CATALYZED CURE OF EPOXY RESINS

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Jul. 7, 1986, Ser. No. 882,331

Int. Cl.[4] C08G *18/00*

U.S. Cl. 528—48 **19 Claims**

1. The process for the acceleration of the cure rate of an epoxy resin comprising forming a mixture of an epoxy resin with a boron trifluoride-amine complex and an isocyanate compound and curing said mixture at a temperature in the range of from about ambient to about 130° C.

4,705,839

URETHANE NONAQUEOUS DISPERSION FOR AUTOMOTIVE BASE COAT/CLEAR COAT APPLICATIONS

Glenn E. Martin, Farmington Hills, Mich., assignor to BASF Corporation, Inmont Division, Clifton, N.J.

Filed Mar. 31, 1987, Ser. No. 32,892
Int. Cl.[4] C08G 18/32
U.S. Cl. 528—49 4 Claims

1. A nonaqueous dispersion particularly adapted for use in automotive base coat/clear coat applications comprising:

a urethane copolymer dispersed throughout a solvent, said solvent being less polar than the urethane copolymer, wherein said urethane copolymer is the reaction product of a stabilizer, polyols, and diisocyanate, and said stabilizer is the reaction product of a carboxylic acid and a monoepoxide, said nonaqueous dispersion when used to produce automotive base coats results in a high solids, low viscosity base coat with good rheology control.

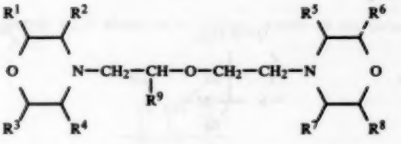
4,705,840

CATALYSTS FOR THE CURING OF A WATER-CURABLE ISOCYANATE-FUNCTIONAL PREPOLYMER

Richard S. Buckanin, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 4, 1985, Ser. No. 784,344
Int. Cl.[4] C08G 18/08; B01J 31/00; C08L 15/00
U.S. Cl. 528—53 17 Claims

13. A method of curing an isocyanate-functional prepolymer comprising forming a mixture of water, a water-curable isocyanate-functional prepolymer and a catalytically effective amount of an amino ether compound having the structural formula:



wherein:

each of R^1–R^8 are individually hydrogen or lower alkyl; and R^9 is a methyl group or a phenyl group wherein the phenyl group may have one or more lower alkyl substitutents.

4,705,841

TBEA LINKED EPOXY-URETHANES

Douglas Tosh, Ajax, and Michael Flynn, Cambridge, both of Canada, assignors to Sternson Limited, Brantford, Canada

Filed Mar. 21, 1986, Ser. No. 842,469
Int. Cl.[4] C08G 18/10
U.S. Cl. 528—59 8 Claims

1. A process for making an epoxy-urethane curable with an epoxy curing agent, comprising the steps of

(a) reacting a quantity of isocyanate terminated polyurethane prepolymer with tertiary butyl ethanolamine, such that the hydroxyl equivalents of said tertiary butyl ethanolamine are approximately equal to or exceed the isocyanate equivalents on said polyurethane prepolymer to produce a urethane-alkanolamine adduct substantially free of isocyanate functionality,

(b) monitoring the infrared absorption of the reaction mixture of step (a) until all of the isocyanate has been consumed,

(c) adding to the reaction mixture a quantity of epoxy resin having an epoxide functionality of two or greater in proportion such that the epoxide equivalents are in excess of the amine equivalents of the urethane-alkanolamine adduct.

4,705,842

PROCESS FOR HARDENING EPOXIDE RESIN MASSES AND A HARDENER SOLUTION THEREFOR

Joachim von Seyerl, Seeon, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Mar. 21, 1986, Ser. No. 842,478
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1985, 3510952
Int. Cl.[4] C08G 59/56
U.S. Cl. 528—88 17 Claims

1. A process for hardening epoxide resin masses, comprising adding to the resin, a hardener solution of dicyandiamide and cyanamide in a weight ratio of from 0 to 10:1 in an organic solvent selected from the group consisting of monomethyl glycol ether, 1-methoxypropan-2-ol, dimethylformamide, acetone, methyl ethyl ketone and a combination of two or more thereof.

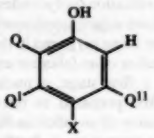
4,705,843

PROCESS FOR THE PRODUCTION OF SUBSTITUTED POLYARYL ETHERS

Günter Stammann, Cologne; Johann Grolig, and Helmut Waldmann, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 8, 1985, Ser. No. 720,942
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3414882
Int. Cl.[4] C08G 59/40, 59/42, 65/00
U.S. Cl. 528—212 11 Claims

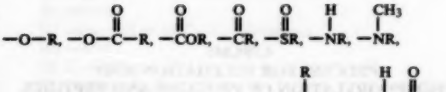
1. A process for the production of polyaryl ethers which comprises oxidizing a phenol in the presence of a catalyst which comprises a copper compound and an organic nitrogen compound in an amount of 0.3 to 4 mols of nitrogen atom per mol of copper ion at an elevated pressure of from 10 to about 1,000 bar wherein said phenol corresponds to formula (I)



(I)

wherein

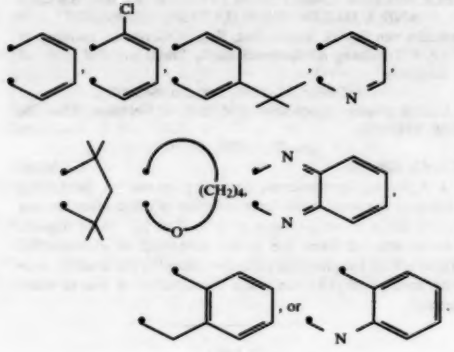
X is halogen, cyano, alkyl having 1 to 20 carbon atoms, aryl having 6 to 10 carbon atoms, aralkyl having 7 to 20 carbon atoms, cycloalkyl having 5 to 12 carbon atoms, heterocyclic moiety having 5 to 12 ring atoms of which no more than three are hereto atoms,



R is alkyl having 1 to 20 carbon atoms, aryl having 6 to 10 carbon atoms, aralkyl having 7 to 20 carbon atoms, cycloalkyl having 5 to 12 carbon atoms or a heterocyclic moiety having 5 to 12 ring atoms of which no more than three are heteroatoms;

Q, Q^1 and Q^{11} are independent of one another and each is hydrogen or one of the definitions of X containing not more than three carbon atoms with the proviso that X is not alkyl simulataneously; and

any two adjacent substituents X,Q,Q^1 and Q^2 takent together as a bivalent substituent are



4,705,844

RAPIDLY CRYSTALLIZING POLYESTER MATERIALS AND A PROCESS FOR THEIR PREPARATION

Bernd Espenschied, Mainz-Kostheim, and Peter Klein, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 5, 1986, Ser. No. 904,685

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1985, 3532033

Int. Cl.[4] C08G 63/04

U.S. Cl. 528—275 13 Claims

1. A process for the preparation of rapidly crystallizing polyesters by the esterification/polycondensation method and/or the transesterification/polycondensation method, at least some of the polyester being prepared in the presence of an (alkaline earth) alkali metal or of an (alkaline earth) alkali metal compound, wherein, in a first stage, a nucleated or highly nucleated polyester is first prepared in the presence of an (alkaline earth) alkali metal or of an (alkaline earth) alkali metal compound, and then, in a second stage, further non-nucleated polyesters and a crystallization accelerator are, if appropriate, added to this polyester, the amount of the crystallization accelerator being sufficiently large to reduce the post-crystallization temperature by at least 4° C. compared with that of the polyester without this organic crystallization accelerator.

4,705,845

PROCESS FOR SULPHATION AND PHOSPHORYLATION OF PROTEINS AND PEPTIDES

Anthony Cerami, Flanders, N.J.; Sandor Pongor, and Michael Brownlee, both of New York, all of N.Y., assignors to Rockefeller University, New York, N.Y.

Continuation of Ser. No. 697,134, Feb. 1, 1985, abandoned, which is a division of Ser. No. 442,492, Nov. 17, 1982, Pat. No. 4,534,894. This application Sep. 5, 1986, Ser. No. 904,056

Int. Cl.[4] A61K 37/26; C07K 7/40, 15/00

U.S. Cl. 530—305 8 Claims

1. A method of phosphorylating a hydroxy containing protein or peptide comprising contacting said protein or peptide with phosphoric acid in a nonaqueous apolar organic solution and a dehydrating agent under conditions favoring phosphorylation of said hydroxy containing protein or peptide.

4,705,846

NOVEL RENIN INHIBITING PEPTIDES HAVING A GAMMA LACTAM PSEUDO DIPEPTIDE INSERT

Suvit Thaisrivongs, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 27, 1986, Ser. No. 844,716

Int. Cl.[4] C07K 5/02, 5/06, 5/08, 5/10, 7/06

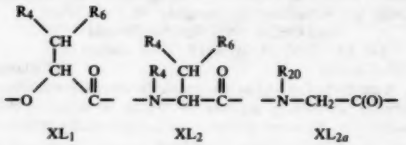
U.S. Cl. 530—332 7 Claims

1. A renin inhibitory peptide of the formula X—A_6—B_7—C-8—D_9—E_{10}—F_{11}—G_{12}—H_{13}—I_{14}—Z,

wherein X is

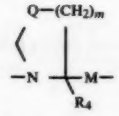
(a) hydrogen,
(b) C_1–C_5alkyl
(c) R_5—O—CH_2—C(O)—,
(d) R_5—CH_2—O—C(O)—,
(e) R_5—O—C(O)—,
(f) R_5—$(CH_2)_n$—C(O)—,
(g) $R_4N(R_4)$—$(CH_2)_n$—C(O)—,
(h) R_5—SO_2—$(CH_2)_q$—C(O)—,
(i) R_5—SO_2—$(CH_2)_q$—O—C(O)—, or
(j) R_6—$(CH_2)_t$—C(O)—;

wherein A_6 is absent or a divalent moiety of the formula XL_1, XL_2, or XL_{2a}



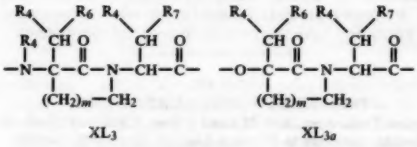
XL_1 XL_2 XL_{2a}

wherein B_7 is absent or a divalent moiety of the formula XL_b



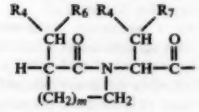
XL_b

wherein C_8—D_9 is XL_3 or XL_{3a}, or



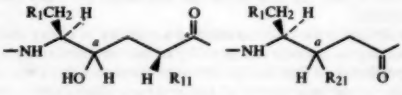
XL_3 XL_{3a}

wherein C_8—D_9 is a monovalent moiety of the formula XL_{3b} when X, A_6, and B_7 are absent;

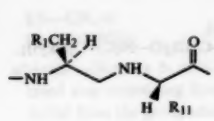


XL_{3b}

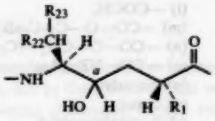
wherein E_{10}—F_{11} is a divalent moiety of the formula XL_6, XL_{6a}, XL_{6b}, XL_{6c}, XL_{6d} or XL_{6e};



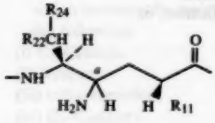
XL_6 XL_{6a}



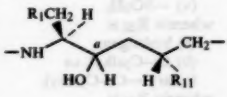
XL_{6b}



XL_{6c}



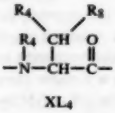
XL_{6d}



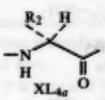
XL_{6e}

wherein * indicates an asymmetric center which is either in the R or S configuration;

wherein G_{12} is absent or a divalent moiety of the formula XL_4 or XL_{4a};

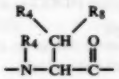


XL_4



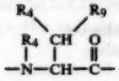
XL_{4a}

wherein H_{13} is absent or a divalent moiety of the formula XL_4;



XL_4

wherein I_{14} is absent or a divalent moiety of the formula XL_5;



XL_5

wherein Z is
(a) —O—R_{10},
(b) —N(R_4)R_{14}, or
(c) C_4–C_8cyclic amino;
wherein R is
(a) isopropyl,
(b) isobutyl,
(c) phenylmethyl, or
(d) C_3–C_7cycloalkyl;
wherein R_1 is
(a) hydrogen,
(b) C_1–C_5alkyl,
(c) aryl,
(d) C_3–C_7cycloalkyl,
(e) —Het,
(f) C_1–C_3alkoxy, or
(g) C_1–C_3alkylthio;
wherein R_2 is
(a) hydrogen, or
(b) —CH(R_3)R_4;
wherein R_3 is
(a) hydrogen,
(b) hydroxy,
(c) C_1–C_5alkyl,
(d) C_3–C_7cycloalkyl,
(e) aryl,
(f) —Het,
(g) C_1–C_3alkoxy, or
(h) C_1–C_3alkylthio;
wherein R_4 at each occurrence is the same or different and is
(a) hydrogen, or
(b) C_1–C_5alkyl;
wherein R_5 is
(a) C_1–C_6alkyl,
(b) C_3–C_7cycloalkyl,
(c) aryl,
(d) —Het, or
(e) 5-oxo-2-pyrrolidinyl;
wherein R_6 is
(a) hydrogen,
(b) C_1–C_5alkyl,
(c) —$(CH_2)_p$—aryl,
(d) —$(CH_2)_p$—Het,
(e) —$(CH_2)_p$—C_3–C_7cycloalkyl,
(f) 1- or 2-adamantyl,
(g) —S—aryl,
(h) —S—C_3–C_7cycloalkyl, or
(i) —S—C_1–C_6—alkyl;
wherein R_7 is
(a) hydrogen,
(b) C_1–C_5alkyl,
(c) hydroxy,
(d) amino C_1–C_4alkyl—,
(e) guanidinyl C_1–C_3alkyl—,
(f) aryl,
(g) —Het,
(h) methylthio,
(i) —$(CH_2)_p$—C_3–C_7cycloalkyl, or
(j) amino;
wherein R_8 is
(a) hydrogen,
(b) C_1–C_5alkyl,
(c) hydroxy,
(d) aryl,
(e) —Het,
(f) guanidinyl C_1–C_3alkyl—, or
(g) —$(CH_2)_p$—C_3–C_7cycloalkyl;
wherein R_9 is
(a) hydrogen,
(b) hydroxy,
(c) amino C_1–C_4alkyl—, or
(d) guanidinyl C_1–C_3alkyl—;
wherein R_{10} is
(a) hydrogen,
(b) C_1–C_5alkyl,
(c) —$(CH_2)_n$$R_{16}$,
(d) —$(CH_2)_n$$R_{17}$,
(e) C_3–C_7cycloalkyl,
(f) a pharmaceutically acceptable cation,
(g) —CH(R_{25})—CH_2—R_{15}, or
(h) —CH_2—CH(R_{12})—R_{15};
wherein R_{11} is —R or —R_2;
wherein R_{12} is —$(CH_2)_n$—R_{13};
wherein R_{13} is
(a) aryl,
(b) amino,
(c) mono-, di or tri-C_1–C_3alkylamino,
(d) —Het,
(e) C_1–C_5alkyl
(f) C_3–C_7cycloalkyl,
(g) C_2–C_5alkenyl,
(h) C_3–C_7cycloalkenyl,
(i) hydroxy,
(j) C_1–C_3alkoxy,
(k) C_1–C_3alkanoyloxy,
(l) mercapto,
(m) C_1–C_3alkylthio,
(n) —COOH,
(o) —CO—O—C_1–C_6alkyl,
(p) —CO—O—CH_2—(C_1–C_3alkyl)—N(C_1–C_3alkyl)$_2$,
(q) —CO—N$R_{22}$$R_{26}$,
(r) C_4–C_7cyclic amino,
(s) C_4–C_7cycloalkylamino,

(t) guanidyl,
(u) cyano,
(v) N-cyanoguanidyl,
(w) cyanoamino,
(x) (hydroxy C_2–C_4alkyl)amino, or
(y) di-(hydroxyC_2–C_4alkyl)amino;

wherein R_{14} is
(a) hydrogen,
(b) C_1–C_{10}alkyl,
(c) —$(CH_2)_n$—R_{18},
(d) —$(CH_2)_n$—R_{19},
(e) —$CH(R_{25})$—CH_2—R_{15},
(f) —CH_2—$CH(R_{12})$—R_{15},
(g) (hydroxy C_1–C_8alkyl), or
(h) (C_1–C_3alkoxy)C_1–C_8alkyl;

wherein R_{15} is
(a) hydroxy,
(b) C_3–C_7cycloalkyl,
(c) aryl,
(d) amino,
(e) mono-, di-, or tri-C_1–C_3alkylamino,
(f) mono- or di-[hydroxy C_2–C_4alkyl]amino,
(g) —Het,
(h) C_1–C_3alkoxy—,
(i) C_1–C_3alkanoyloxy—,
(j) mercapto,
(k) C_1–C_3alkylthio—,
(l) C_1–C_5alkyl,
(m) C_4–C_7cyclic amino,
(n) C_4–C_7cycloalkylamino,
(o) C_1–C_5alkenyloxy,
(p) C_3–C_7cycloalkenyl;

wherein R_{16} is
(a) aryl,
(b) amino,
(c) mono- or di-C_1–C_3alkylamino,
(d) hydroxy,
(e) C_3–C_7cycloalkyl,
(f) C_4–C_7cyclic amino, or
(g) C_1–C_3alkanoyloxy;

wherein R_{17} is
(a) —Het,
(b) C_2–C_5alkenyl,
(c) C_3–C_7cycloalkenyl,
(d) C_1–C_3alkoxy,
(e) mercapto,
(f) C_1–C_3alkylthio,
(g) —COOH,
(h) —CO—O—C_1–C_6alkyl,
(i) —CO—O—CH_2—(C_1–C_3alkyl)—N(C_1–C_3alkyl)$_2$,
(j) —CO—$NR_{22}R_{26}$,
(k) tri-C_1–C_3alkylamino,
(l) guanidyl,
(m) cyano,
(n) N-cyanoguanidyl,
(o) (hydroxy C_2–C_4alkyl)amino,
(p) di-(hydroxy C_2–C_4alkyl)amino, or
(q) cyanoamino;

wherein R_{18} is
(a) amino,
(b) mono-, or di-C_1–C_3alkylamino,
(c) C_4–C_7cyclic amino; or
(d) C_4–C_7cycloalkylamino;

wherein R_{19} is
(a) aryl,
(b) —Het,
(c) tri-C_1–C_3alkylamino,
(d) C_3–C_7cycloalkyl,
(e) C_2–C_5alkenyl,
(f) C_3–C_7cycloalkenyl,
(g) hydroxy,
(h) C_1–C_3alkoxy,
(i) C_1–C_3alkanoyloxy,
(j) mercapto,
(k) C_1–C_3alkylthio,
(l) —COOH,
(m) —CO—O—C_1–C_6alkyl,
(n) —CO—O—CH_2—(C_1–C_3alkyl)—N(C_1–C_3alkyl)$_2$,
(o) —CO—$NR_{22}R_{26}$,
(p) guanidyl,
(q) cyano,
(r) N-cyanoguanidyl,
(s) cyanoamino,
(t) (hydroxy C_2–C_4alkyl)amino,
(u) di-(hydroxy C_2–C_4alkyl)amino; or
(v) —SO_3H;

wherein R_{20} is
(a) hydrogen,
(b) C_1–C_5alkyl, or
(c) aryl—C_1–C_5alkyl;

wherein R_{21} is
(a) —NH_2, or
(b) —OH;

wherein R_{22} is
(a) hydrogen, or
(b) C_1–C_3alkyl;

wherein R_{23} is
(a) —$(CH_2)_n$—OH,
(b) —$(CH_2)_n$—NH_2,
(c) aryl, or
(d) C_1–C_3alkyl;

wherein R_{24} is
(a) —R_1,
(b) —$(CH_2)_n$—OH, or
(c) —$(CH_2)_n$—NH_2;

wherein R_{25} is
(a) hydrogen,
(b) C_1–C_3alkyl, or
(c) phenyl—C_1–C_3alkyl;

wherein R_{26} is
(a) hydrogen,
(b) C_1–C_3alkyl, or
(c) phenyl—C_1–C_3alkyl;

wherein m is one or two;

wherein for each occurrence n is independently an integer of zero to five, inclusive;

wherein p is zero to 2 inclusive;

wherein q is 1 to 5, inclusive;

wherein Q is
(a) —CH_2—,
(b) —CH(OH)—,
(c) —O—, or
(d) —S—; and

wherein M is
(a) —CO—, or
(b) —CH_2—;

wherein aryl is phenyl or naphthyl substituted by zero to 3 of the following:

(a) C_1–C_3alkyl,
(b) hydroxy,
(c) C_1–C_3alkoxy,
(d) halo,
(e) amino,
(f) mono- or di-C_1–C_3alkylamino,
(g) —CHO,
(h) —COOH,
(i) $COOR_{26}$,
(j) $CONHR_{26}$,
(k) nitro,
(l) mercapto,
(m) C_1–C_3alkylthio,
(n) C_1–C_3alkylsulfinyl,
(o) C_1–C_3alkylsulfonyl,
(p) —N(R_4)—C_1–C_3alkylsulfonyl,
(q) SO_3H,
(r) SO_2NH_2,

(s) —CN, or
(t) $—CH_2NH_2$;

wherein —Het is a 5- or 6-membered saturated or unsaturated ring containing from one to three heteroatoms selected from the group consisting of nitrogen, oxygen, and sulfur; and including any bicyclic group in which any of the above heterocyclic rings is fused to a benzene ring, which heterocyclic moiety is substituted with zero to 3 of the following:
(i) C_1–C_6alkyl,
(ii) hydroxy,
(iii) trifluoromethyl,
(iv) C_1–C_4alkoxy,
(v) halo,
(vi) aryl,
(vii) aryl C_1–C_4alkyl—,
(viii) amino,
(ix) mono- or di-C_1–C_4alkylamino, and
(x) C_1–C_5alkanoyl;
with the overall provisos that
(1) R_{18} or R_{19} is hydroxy, mercapto, or amino, or a mono-substituted nitrogen containing group bonded through the nitrogen only when n is not one;
(2) R_{12} is $—(CH_2)_n—R_{13}$ and n is zero and both R_{13} and R_{15} are oxygen-, nitrogen-, or sulfur-containing substituents bonded through the hetero atom, only when the hetero atom is not also bonded to hydrogen;
(3) R_{17} or R_{19} is —COOH only when n for that moiety is other than zero;
(4) R_{16} or R_{17} is an amino-containing substituent, hydroxy, mercapto, or —Het bonded through the hetero atom only when n for that substituent is an integer from two to five, inclusive;
(5) when R_{12} is $—(CH_2)_n—R_{13}$ and n is zero, then R_{13} and R_{15} cannot both be —COOH; and
(6) R_{17} or R_{19} is —Het, only when —Het is other than cyclic amino;
or a carboxy-, amino-, or other reactive group-protected form thereof;
or a pharmaceutically acceptable acid addition salt thereof.

4,705,847

POLYCYCLOALKYLIDENE-POLYCYCLOALKANES, EPIDIOXY DERIVATIVES THEREOF AND METHOD OF PREPARATION

Jan C. Hummelen, Groningen; Egbert W. Meijer, Waalre-Aalst, and Hans Wynberg, Haren, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

PCT No. PCT/NL83/00014, § 371 Date Dec. 7, 1983, § 102(e) Date Dec. 7, 1983, PCT Pub. No. WO83/03604, PCT Pub. Date Oct. 27, 1983
PCT Filed Apr. 7, 1983, Ser. No. 568,224
Claims priority, application Netherlands, Apr. 7, 1982, 8201492
Int. Cl.⁴ C07D 9/00, 321/00; C07C 23/38
U.S. Cl. 530—350 **34 Claims**

1. A process for preparing a 4-equatorially halogen-substituted polycyclo-alkylidene polycyclo-alkane, comprising halogenating, in a solvent, the corresponding nonsubstituted polycyclo-alkylidene polycyclo-alkane compound with a halogenating agent of the class consisting of N-halosuccinimide, tert.-butyl-hypohalite and sodium hypohalite/CH_3COOH.

11. A process for preparing a 4-equatorially substituted epidioxy polycyclo-alkylidene polycyclo alkane, comprising subjecting a compound selected from the group consisting of:
A. 4-equatorially-halogen-substituted polycycloalkylidene polycyclo-alkane formed by halogenating, in a solvent, the corresponding non-substituted polycyclo-alkylidene polycyclo-alkanes with a halogenating agent of the class consisting of N-halosuccinimide, tert.-butyl-hypohalite, and sodium hypohalite/CH_3COOH, and
B. The compounds resulting from substituting said halogen in said 4-equatorially-halogen-substituted polycyclo-alkylidene polycyclo-alkanes with a nucleophile,
to a photo-oxygenation reaction.

4,705,848

ISOLATION OF BIOACTIVE, MONOMERIC GROWTH HORMONE

Ren-Der Yang; Edwin J. Hamilton, Jr., both of Terre Haute, and Larry D. Taber, Indianapolis, all of Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Jun. 2, 1986, Ser. No. 869,702
Int. Cl.⁴ A61K 37/36
U.S. Cl. 530—399 **19 Claims**

1. A process for recovering and purifying monomeric, biologically active growth hormone from insoluble inclusion bodies produced by expression of a heterologous gene in a microorganism, which process comprises:
(a) solubilizing and denaturing the growth hormone by extracting the inclusion bodies into a solution of a guanidine salt;
(b) renaturing at least a portion of the growth hormone in the solution and inducing precipitation of at least a portion of contaminant proteins and aggregates in the solution by replacing the guanidine salt solution with a denaturant-free buffer solution without the use of an intermediate denaturant, thereby reducing the presence of soluble contaminant proteins and agregates in the renatured protein solution which tend to foul the chromatography column and which are not biologically active;
(c) removing the precipitated contaminants and aggregates from the denaturant-free buffer solution; and
(d) purifying the monomeric growth hormone in the solution by ion exchange chromatography.

4,705,849

BORONIC ACID ADDUCTS OF TECHNETIUM-99m DIOXIME COMPLEXES

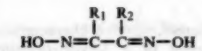
Adrian D. Nunn, Hopewell; Thomas A. Feld, Califon, both of N.J., and Elizabeth N. Treher, Washington Crossing, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 15, 1985, Ser. No. 723,601
Int. Cl.⁴ A61K 43/00, 49/02; C07F 13/00
U.S. Cl. 534—14 **28 Claims**

1. A boronic acid adduct of technetium-99m dioxime complexes having the formula

$$^{99m}Tc\ X(Y)_3\ Z,$$

wherein
X is an anion;
Y is a vicinal dioxime having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1

and R_2 are each independently hydrogen, halogen, alkyl, aryl, amino or a 5 or 6-membered nitrogen or oxygen containing heterocycle, or together R_1 and R_2 are $-(CR_8R_9)_n-$wherein n is 3, 4, 5 or 6 and R_8 and R_9 are each independently hydrogen or alkyl; and

Z is a boron derivative of the formula

wherein R_3 is hydroxy, alkyl, alkenyl, cycloalkyl, cycloalkenyl, alkoxy, carboxyalkyl, carboxyalkenyl, hydroxyalkyl, hydroxyalkenyl, alkoxyalkyl, alkoxyalkenyl, haloalkyl, haloalkenyl, aryl, arylalkyl or (R_4R_5N)-alkyl and R_4 and R_5 are each independently hydrogen, alkyl, or arylalkyl, or R_4 and R_5 when taken together with the nitrogen atom to which they are attached form a 5 or 6-membered nitrogen containing heterocycle.

4,705,850

C-GLYCOSIDIC ADRIAMYCIN ANALOGS

Edward M. Acton, Menlo Park; Kenneth J. Ryan, Sunnyvale, and Michael Tracy, Menlo Park, all of Calif., assignors to SRI International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 664,524, Oct. 25, 1984, abandoned. This application Nov. 23, 1984, Ser. No. 674,175

Int. Cl.[4] C07H *7/02, 15/24*

U.S. Cl. 536—1.1 **17 Claims**

1. A method of preparing derivatives of a 2-deoxyhexopyranose having a pentadienyl substituent in place of OH at C-1 which comprises treating 1-position-activated-2-deoxyhexopyranose, with a 1-trimethylsilyl-2,4-pentadiene compound in a reaction mixture which includes a Lewis acid.

4,705,851

PROCESS FOR THE PREPARATION OF 3-PHOSPHONIUMMETHYL-3-CEPHEM COMPOUNDS

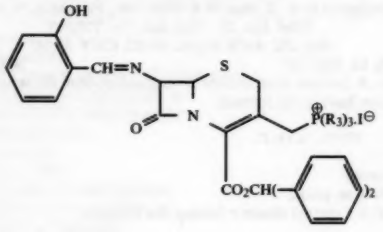
Takao Takaya, Kawanishi; Hisashi Takasugi, Osaka; Takashi Masugi, Ikeda; Hideaki Yamanaka, Hirakata, and Kohji Kawabata, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Sep. 28, 1984, Ser. No. 655,458

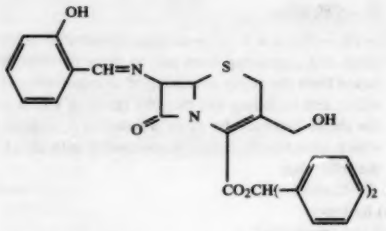
Int. Cl.[4] C07D *501/22;* **A61K** *31/545*

U.S. Cl. 540—215 **2 Claims**

1. A process for the preparation of a 3-phosphoniummethyl-3-cephem compound of the formula:



wherein R_3 is aryl, or a salt thereof, which is characterized by reacting one equimolar amount of a 3-hydroxymethyl-3-cephem compound of the formula:



or a salt thereof, with two or a little over two equimolar amount of triarylphosphine and one or a little over one equimolar amount of iodine.

4,705,852

1-OXADETHIA CEPHALOSPORIN HYDROXAMIC ACID DERIVATIVES

Wataru Nagata, Hyogo; Tsutomu Aoki, and Yasuhiro Nishitani, both of Osaka, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

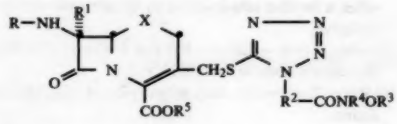
Division of Ser. No. 576,404, Feb. 2, 1984, Pat. No. 4,614,797. This application Jun. 20, 1986, Ser. No. 876,976

Claims priority, application Japan, Feb. 17, 1983, 58-25940

Int. Cl.[4] C07D *205/08;* **A61K** *31/535*

U.S. Cl. 540—301 **7 Claims**

1. A 7β-amino-3-[1-(N-hydroxyaminocarbonylalkyl)-1H-tetrazol-5-ylthiomethyl]-3-cephem-4-carboxylic acid derivative represented by the following formula:



(wherein

R is hydrogen;

R^1 is hydrogen or methoxy;

R^2 is alkylene;

R^3 is hydrogen, alkyl, or a hydroxy-protecting group;

R^4 is hydrogen or an amino protecting group;

R^5 is hydrogen, a pharmaceutically acceptable salt forming group, or an ester forming group; and

X is oxygen.

4,705,853

FUSED AROMATIC OXAZEPINONES, THIAZEPINONES, DIAZEPINONES AND SULFUR ANALOGS THEREOF

Albert D. Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

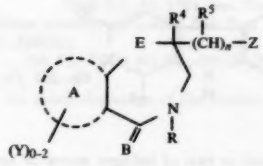
Continuation-in-part of Ser. No. 746,091, Jun. 18, 1985, Pat. No. 4,592,866, which is a continuation-in-part of Ser. No. 652,058, Sep. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 527,559, Aug. 29, 1983, abandoned, which is a continuation-in-part of Ser. No. 431,500, Sep. 30, 1982, abandoned. This application Mar. 3, 1986, Ser. No. 835,805

The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.

Int. Cl.[4] C07D *281/08, 267/14, 419/14, 498/04*

U.S. Cl. 540—490 **31 Claims**

1. A compound selected from the group having the formula:



wherein;

A represents an aromatic ring having two of its carbon atoms held mutually with the oxazepine, thiazepine, or diazepine moiety selected from the group consisting of benzene, naphthalene, a quinoline, or a pyridine in any of its four positions, any of the rings optionally substituted by one or two Y radicals selected from the group consisting of halo, loweralkyl, loweralkoxy, diloweralkylamino, nitro, amino, loweracylamino, trifluoromethyl, phenyl or phenyl substituted by one to three Y' groups selected from halo, loweralkyl, loweralkoxy, diloweralkylamino, nitro, amino, loweracylamino or trifluoromethyl,

E is selected from oxygen, sulfur or

B is selected from oxygen or sulfur,

R is selected from the group consisting of hydrogen, loweralkyl, cyclic alkyl containing 3–9 carbon atoms or phenylloweralkyl of which phenyl may be optionally substituted by one or two radicals selected from halo, loweralkyl, loweralkoxy, nitro, or trifluoromethyl,

n is 1, 2 or 3,

R^4 and R^5 are selected from hydrogen or loweralkyl (1–5C),

Z is selected from the group consisting of $—NR^1R^2$, 1H-pyrazol-1-yl, 1H-imidazol-1-yl, 1H-imidazol-2-yl or 4,5-dihydro-1H-imidazol-2-yl,

R^1 and R^2 are selected from the group consisting of hydrogen, loweralkyl, cyclic alkyl containing 3–9 carbon atoms, phenyl and phenyl-loweralkyl of which phenyl may be optionally substituted by 1 or 2 radicals selected from halo, loweralkyl, loweralkoxy, nitro, trifluoromethyl or cyano, or R^1 and R^2 taken together with the adjacent nitrogen atom may form a heterocyclic residue selected from the group consisting of 1-azetidinyl, 1-pyrrolidinyl, 2,5-dimethylpyrrolidin-1-yl, 2-methylpyrrolidin-1-yl, 1-piperidinyl, 4-substituted-piperidine-1-yl, 4-[bis-(4-fluorophenyl)methyl]-piperidin-1-yl, 4-morpholinyl, 1-piperazinyl, 4-substituted piperazin-1-yl, 1,2,3,6-tetrahydropyridin-1-yl, 1H-pyrrol-1-yl or 2,5-dihydro-1H-pyrrol-1-yl, the optical isomers thereof and the pharmaceutically acceptable salts thereof with the proviso that when R=H, Z is never a primary or secondary amine and a further proviso that when n=3, Z is not pyrazolyl or imidazolyl.

5. The compound of claim 1 which is 7-acetylamino-2-[2-(dimethylamino)ethyl]-2,3-dihydro-4-methyl-1,4-benzoxazepine-5(4H)-thione or a pharmaceutically acceptable salt thereof.

4,705,854

PHENOTHIAZINE COMPOUNDS

Harry J. Leighton, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

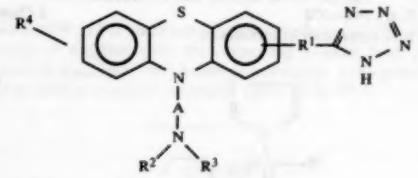
Filed May 28, 1985, Ser. No. 738,846

Claims priority, application United Kingdom, May 31, 1984, 8413915

Int. Cl.[4] C07D *279/28*

U.S. Cl. 544—41 2 Claims

1. A compound of formula (III):



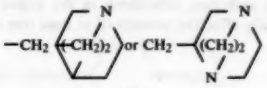
wherein

R^1 is a C_{1-7} bivalent aliphatic hydrocarbon group or a single bond;

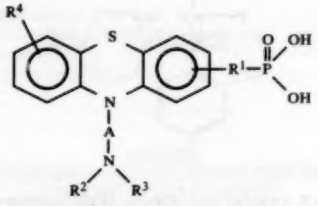
R_2 and R_3 are the same or different and are each hydrogen, C_{1-4} alkyl or taken together with the nitrogen comprise a nitrogen-containing heterocyclic ring having four to six ring members;

R^4 is hydrogen, halogen, C_{1-4} alkoxy, C_{1-4} alkyl, C_{1-4} alkyl substituted by one to three halogen atoms; or a group R_1CO_2H wherein R^1 is herein defined; and

A is C_{1-4} alkylene or ANR_2R_3 forms a group



2. A compound of the formula:



or a salt, ester or amide thereof; wherein

R^1 is a C_{1-7} bivalent aliphatic hydrocarbon group or a single bond;

R_2 and R_3 are the same or different and are each hydrogen, C_{1-4} alkyl or taken together with the nitrogen comprise a nitrogen-containing heterocyclic ring having four to six ring members;

R_4 is hydrogen, halogen, C_{1-4} alkoxy, C_{1-4} alkyl, C_{1-4} alkyl substituted by one to three halogen atoms; or a group R_1CO_2H where R^1 is herein defined; and

A is C_{1-4} alkylene or ANR_2R_3 forms a group

4,705,855

1-[2-(2,4-DICHLOROPHENYL)-2-(4-SUBSTITUTED PIPERAZINE)ETHYL]-1H-IMIDAZOLES HAVING ANTIMYCOTIC AND ANTIBACTERIAL ACTIVITIES, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Derio Desideri, San Fruttuoso di Monza; Riccardo Stradi, Milan, and Alberto Milanese, San Fruttuoso di Monza, all of Italy, assignors to Rottapharm S.p.A., Varese, Italy

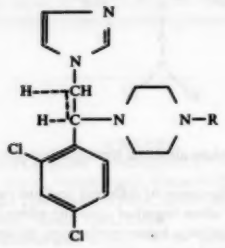
Filed Mar. 17, 1986, Ser. No. 840,495

Claims priority, application Italy, Apr. 15, 1985, 20337 A/85

Int. Cl.[4] C07D *403/06, 403/14;* A61K *31/495*

U.S. Cl. 544—370 **3 Claims**

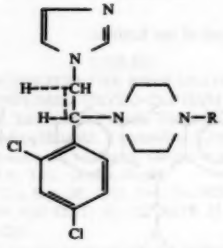
1. A compound of formula I



(I)

wherein R is phenyl; phenyl mono- or di-substituted by halogen atoms, methyl, methoxy, nitro, or trifluoromethyl groups; or a 2-, 3- or 4-pyridyl group; and pharmaceutically acceptable acid addition salts thereof.

3. A pharmaceutical composition having antimycotic and antibacterial activities, containing as the active ingredient a therapeutically effective amount of at least one compound of formula I



wherein R is phenyl; phenyl mono- or di- substituted by halogen atoms, methyl, methoxy, nitro, or trifluoromethyl; or a 2-, 3- or 4-pyridyl; and pharmaceutically acceptable acid addition salts thereof; together with at least one pharmaceutically acceptable excipient.

4,705,856

PROCESS FOR PRODUCING β-CARBOLINE DERIVATIVES

Helmut Biere, Berlin, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

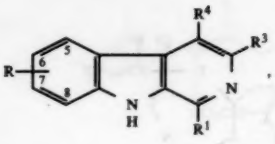
Filed Oct. 28, 1983, Ser. No. 546,356

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1982, 3240511

Int. Cl.[4] C07F *9/65;* C07D *471/04, 401/14*

U.S. Cl. 546—21 **15 Claims**

1. A process for producing a β-carboline of the formula

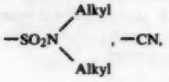


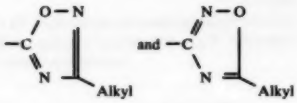
(I)

wherein

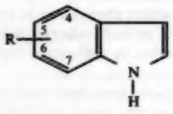
R is hydrogen, one or two of halogen atoms or organic substituents in 5-, 6-, 7- or 8-position(s), R^1 and R^4 are the same or different and each is hydrogen, alkyl of 1 to 3 carbon atoms or C_{1-3}-alkoxy-C_{1-3}-alkyl,

R^3 is Phenyl, —COOAlkyl, $—PO_3(Alkyl)_2$, $—SO_2Aryl$, $—SO_2Alkyl$,

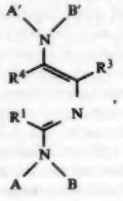




wherein each alkyl group is of 1–3 carbon atoms, comprising reacting an indole of the formula



wherein R is as defined above, with an azabutadiene of the formula



(III)

wherein A, B, A′ and B′, each independently, is alkyl of 1 to 3 carbon atoms or A and B or A′ and B′ together with the adjoining N atom form a pyrrolidino, piperidino, morpholino or piperazino group, and R^1, R^3 and R^4 as defined above, in the presence of an acid at an effective temperature of 75° to 200° C.

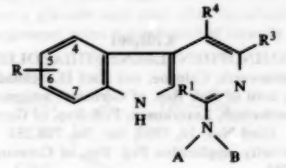
4,705,857

INDOLE DERIVATIVES, PROCESS FOR PRODUCING THEM AND THEIR USE AS INTERMEDIATES

Helmut Biere, Berlin, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Oct. 28, 1983, Ser. No. 547,555
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1982, 3240513
Int. Cl.[4] C07D *491/04, 498/00, 209/56, 209/36*
U.S. Cl. 546—65 18 Claims

1. An indole derivative of the formula

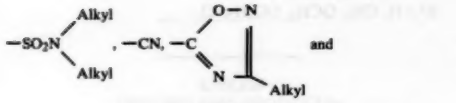


wherein

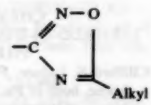
R is hydrogen or one or two of halogen atoms, alkyl, alkoxyalkyl or alkoxy each of 1 to 4 carbon atoms, methylenedioxy, benzyloxy, aza, cyano, or alkoxycarbonyl or dialkylamino, each of 1 to 4 carbon atoms in each alkyl portion, in the 4-, 5-, 6- or 7-position(s),

R^1 and R^4 are the same or different and each is hydrogen, alkyl of 1 to 3 carbon atoms or C_{1-3}-alkoxy-C_{1-3}-alkyl,

R^3 is phenyl, —COOalkyl, $—PO_3(alkyl)_2$, $—SO_2$aryl, $—SO_2$alkyl,



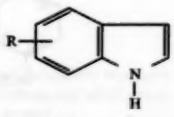
and



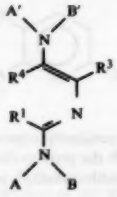
wherein each alkyl is of 1–3 C-atoms and aryl is phenyl or α- or β-naphthyl, and

A and B each independently is alkyl of 1 to 3 carbon atoms, or together with the connecting N-atom form pyrrolidino, piperidino, morpholino or piperazino.

10. A process for preparing an indole derivative of claim 1, as predominant product comprising, reacting a corresponding indole of the formula



with a corresponding azabutadiene of the formula:



wherein A′ and B′, each independently is alkyl of 1 to 3 carbon atoms or together with the connecting N-atom form pyrrolidino, piperidino, morpholino or piperazino, in the presence of an acid at an effective temperature of 0° to 50° C.

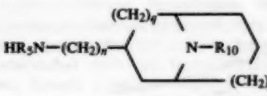
4,705,858

AZABICYCLO[3.3.1]NONANES

Michael S. Hadley, Sawbridgeworth, and Francis D. King, Newport, both of England, assignors to Beecham Group p.l.c., England

Division of Ser. No. 469,681, Feb. 25, 1983, Pat. No. 4,599,420, which is a division of Ser. No. 271,990, Jun. 9, 1981, Pat. No. 4,544,660, which is a continuation-in-part of Ser. No. 107,413, Dec. 26, 1979, Pat. No. 4,273,778. This application Jan. 31, 1986, Ser. No. 824,458
Claims priority, application United Kingdom, Dec. 30, 1978, 50380/78; Mar. 15, 1979, 7909262; Aug. 9, 1979, 7927831
Int. Cl.[4] C07D *451/14*
U.S. Cl. 546—112 4 Claims

1. A compound of formula (XIII):



(XIII)

wherein:

R_5 is hydrogen or C_{1-6} alkyl;

R_{10} is C_{1-7} alkyl or $(CH_2)_tR_8$ wherein t is 1 or 2 and R_8 is C_{2-5} alkenyl;

n is 0, p is 1 and q is 1.

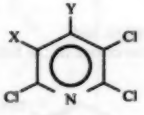
4,705,859

POLYCHLOROPYRIDINE PRODUCTION FROM POLYCHLORO-2,3-LUTIDINES

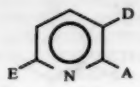
Jon A. Orvik, Walnut Creek, and Thomas J. Dietsche, Berkeley, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 22, 1986, Ser. No. 889,052
Int. Cl.[4] C07D *211/72*
U.S. Cl. 546—345 31 Claims

1. A process for preparing a polychloropyridine of the formula



wherein X and Y each, independently represents H or Cl which comprises contacting a polychloro-2-3-lutidine of the formula



wherein

A and D each, independently represents mono-, di- or trichloromethyl, with the proviso that at least one of A and D is other than trichloromethyl; and

E represents H or Cl

with chlorine in the liquid phase under conditions conducive to chlorination.

4,705,860

QUATERNARY AMMONIUM SALTS AND THEIR USE AS DRAG REDUCING AGENTS

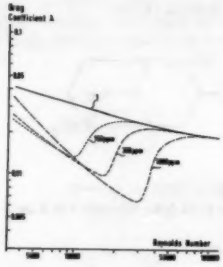
Dieter Ohlendorf, Liederbach; Heinz Hoffmann, Bayreuth; Werner Interthal, Rüsselsheim, and Ulrich Pintschovius, Hattersheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 508,495, Jun. 27, 1983, abandoned. This application Mar. 11, 1986, Ser. No. 838,893

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1982, 3224148

Int. Cl.[4] C07D *213/02;* **C07C** *87/30, 87/68*

U.S. Cl. 546—347 **3 Claims**



1. A quaternary ammonium salt of the formula

$$R_1-K^{\oplus}A^{\ominus}$$

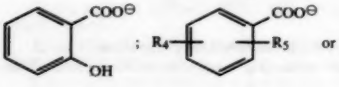
in which

R_1 denotes C_{12}–C_{26}-alkyl or C_{12}–C_{26}-alkenyl, $K^{\oplus}$ denotes a group of the formula

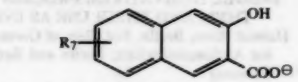
or $-{}^{\oplus}N(R_2)_3$,

R_2 denotes C_1–C_3-alkyl, and

$A^{\ominus}$ denotes an anion of one of the following formulae:



-continued



in which

R_4 is C_1–C_5-alkyl, C_2–C_5-alkenyl or C_1–C_5-alkoxy in positions 3, 4, 5 or 6, R_5 is hydrogen or hydroxyl in positions 2 or 3, and R_7 is hydrogen or methyl, with the exception of the salicylate ion when combined with C_{16}-alkylpyridinium or C_{16}-alkyltrimethylammonium.

4,705,861

AMINOPHENYLBENZOTHIAZOLES

Hauke Fürstenwerth, Cologne, and Karl H. Schündehütte, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

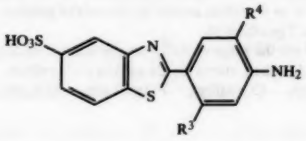
Filed Nov. 14, 1985, Ser. No. 798,253

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443594

Int. Cl.[4] C07D *277/66*

U.S. Cl. 548—178 **2 Claims**

1. A benzothiazole derivative of the formula



wherein

R^3=H, CH_3, OCH_3, OC_2H_5, Cl

R^4=H, CH_3, OCH_3, OC_2H_5, Cl.

4,705,862

CHEMICAL PROCESSES FOR 2-(2-HALO-3,4-DIMETHOXYBENZYL)-5-(4-METHOXYPHENYL)OXAZOLIDINES

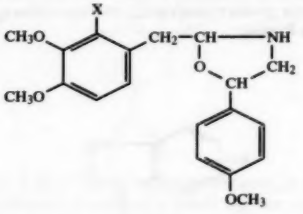
Clifford S. Labaw, Philadelphia, and Alan W. Tremper, Lansdowne, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Continuation of Ser. No. 657,904, Oct. 5, 1984, abandoned. This application Sep. 19, 1986, Ser. No. 909,759

Int. Cl.[4] C07D *263/06, 223/16*

U.S. Cl. 548—215 **4 Claims**

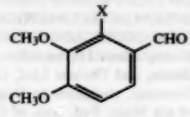
1. A process for preparing a compound of formula (1):



(1)

in which X is chloro or fluoro, that comprises:

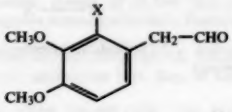
(i) reacting a compound of formula (2):



(2)

in which X is chloro or fluoro, with an excess of α-halo lower alkyl alkanoate in the presence of an alkali metal C_{1-4} alkoxide dissolved in a homogeneous solvent system of methylene chloride-methanol at a temperature selected from the range of −25° C. to 50° C. to give a glycidic acid ester;

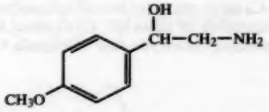
(ii) treating the glycidic acid ester with aqueous base to produce a glycidic acid that, after decarboxylation and rearrangement, gives a compound of formula (3):



(3)

in which X is chloro or fluoro; and

(iii) reacting the formula (3) compound with an excess of a compound of formula (4):



(4)

to form a formula (1) compound.

4,705,863

PROCESS FOR PRODUCING PYRAZOLO[1,5-B][1,2,4]TRIAZOLE DERIVATIVES

Tadahisa Sato; Toshio Kawagishi, and Nobuo Furutachi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

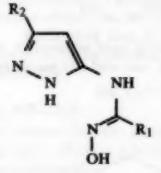
Filed Mar. 20, 1985, Ser. No. 713,989

Claims priority, application Japan, Mar. 22, 1984, 59-53443

Int. Cl.⁴ C07D *487/04*

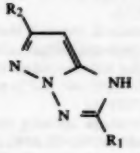
U.S. Cl. 548—262 **14 Claims**

1. A process for producing pyrazolo[1,5-b][1,2,4]triazole derivatives which comprise subjecting a compound represented by the formula:



(where R_1 and R_2 independently represent a hydrogen atom or a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group)

to dehydrating ring closure to give a compound represented by the formula:



(where R_1 and R_2 are defined as above).

4,705,864

ARYL OXIME DERIVATIVES OF HYDANTOINS

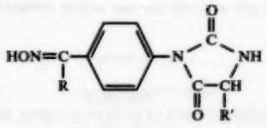
Mark C. Cesa, South Euclid; James E. Rinz, University Heights, and Teodora T. Kopp, Garfield Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Nov. 10, 1986, Ser. No. 928,770

Int. Cl.⁴ C07D *403/04, 233/76, 233/78*

U.S. Cl. 548—309 **2 Claims**

1. A compund of the formula



where each of R and R′ has zero to 10 C atoms and no ethylenic or acetylenic unsaturation; R is H or hydrocarbyl; R′ is H, hydrocarbyl, or hydrocarbyl substituted with hydrocarbylcarbonylamino, di(hydrocarbylcarbonyl)amino, hydrocarbylcarbonyl(hydrocarbyl)amino, formylamino, diformylamino and formyl(hydrocarbyl)amino, hydrocarbyloxy, hydrocarbylthio, formylthio, hydrocarbylcarbonylthio, hydrocarbyloxycarbonyl, hydrocarbyl carboxyl, hydrocarbylamino, dihyrocarbylamino, formyl, 3-indolyl, 3-(1-hydrocarbyl)indolyl, 3-(1-hydrocarbylcarbonyl)indolyl, 3-(1-formyl)indolyl, carbamoyl, hydrocarbylcarbamoyl, dihydrocarbylcarbamoyl, 5-imidazolyl, 5-(3-hydrocarbyl)imidazolyl, 5-(3-hydrocarbylcarbonyl-)imidazolyl, or 5-(3-formyl)imidazolyl.

4,705,865

CATIONIC REACTION PRODUCTS FORMED FROM 1-AMINOALKYL-IMIDAZOLE COMPOUNDS AND EPIHALOHYDRINS

Rosemarie Töpfl, Dornach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

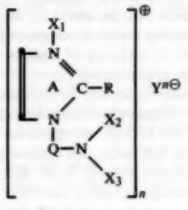
Filed Nov. 4, 1985, Ser. No. 794,941

Claims priority, application Switzerland, Jan. 21, 1985, 260/85

Int. Cl.⁴ C07D *231/12*

U.S. Cl. 548—341 **8 Claims**

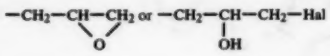
2. An imidazolium compound of the formula



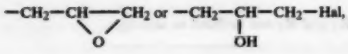
(1)

wherein

X_1 and X_2 independently of one another are each the group



X_3 is hydrogen, lower alkyl,



Hal is halogen,

Q is alkylene having 2 to 4 carbon atoms,

R is hydrogen, phenyl or an aliphatic C_1-C_{23}-radical,

n is 1 or 2, and

$Y^{\ominus}$ is an anion of a strong inorganic or organic acid, and wherein the imidazole ring A is furhter unsubstituted, or is further substituted by lower alkyl which is unsubstituted or substituted by halogen, hydroxyl or cyano.

4,705,866

SYNTHESIS OF N-HALOGENATED PHENYL MALEIMIDE COMPOUNDS WITH TIN CONTAINING CATALYSTS

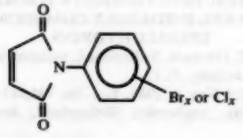
Robert G. Gastinger, Brookhaven, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 26, 1985, Ser. No. 813,362

Int. Cl.[4] C07D *207/444, 207/452*

U.S. Cl. 548—549 **12 Claims**

1. A process for the preparation of an N-brominated or N-chlorinated phenylmaleimide having the formula



wherein each x separately represents an integer of 1 to 5 which comprises reacting at a temepature from about 100° C. to about 210° C., maleic anhydride with a brominated or chlorinated aniline at a molar ratio of anhydride to aniline of from about 1.0 to 10.0:1.0 in the presence of from about 0.1 about 100 weight percent of a tin containing catalyst compound based on the amount of brominated or chlorinated aniline employed and being selected from the group consisting of tin (II) halides, tin (IV) halides, tin (II) acetate, tin (II) 2-ethyhexanoate, tin oxalate, tin (IV) acetate, triorganotin halides having the formulae R_3SnX, $R_2R'SnX$ or $RR'R''SnX$, diorganotin halides having the formulae R_2SnX_2 or $RR'SnX_2$, and monoorganotin halides having the formula $RSnX_3$ wherein R, R' and R'' is methyl, ethyl, propyl, butyl, phenyl or benzyl and X is F, Cl, Br or I, and dialkyltin oxides having the formula (R_2SnO) wherein R is an alkyl group having from 1 to 10 carbon atoms.

4,705,867

PROCESS FOR THE PRODUCTION OF 1,2-DITHIOLAN-3-PENTANOIC ACID (THIOCTIC ACID) AND INTERMEDIATE COMPOUNDS THEREFOR

Guenes Giray, Kleinostheim; Klaus Huthmacher, Gelnhausen; Axel Kleemann, Mühlheim, and Thomas Lied, Obertshausen, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

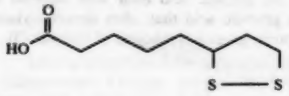
Filed Apr. 4, 1986, Ser. No. 848,212

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1985, 3512911

Int. Cl.[4] C07D *339/04*

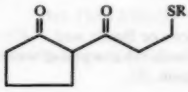
U.S. Cl. 549—39 **5 Claims**

1. A process for preparing thioctic acid of the formula



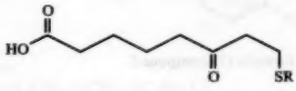
IX

comprising (a) reacting a 2-(3-alkylthiopropionyl)-cyclopentan-1-one of the formula



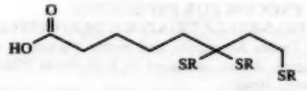
V

where R is a C_1–C_4 alkyl, phenyl or benzyl in aqueous alkaline solution at a temperature of about 20° C. to about 90° C. to form the corresponding carboxylic acid of formula VI



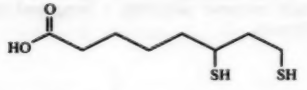
VI

(b) reacting the compound of formula VI with an alkyl mercaptan at a temperature between −20° C. and 0° C. to form the corresponding thioketal of formula VII



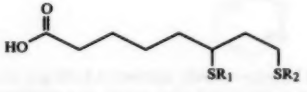
VII

(c) reacting the compound of formula VII with sodium in liquid ammonia at a temperature between −60° C. and −10° C. to form the 6,8-dimercaptooctanoic acid of formula VIII



VIII

(d) reacting the 6,8-dimercaptooctanoic acid of formula VIII in alkaline solution with an iron (III) salt and oxygen to form the thioctic acid of formula IX

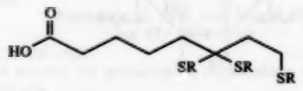


XII

where R_1 and R_2 are hydrogen, C_1–C_4-alkyl, phenyl or benzyl, with the proviso that both R_1 and R_2 cannot be benzyl, with sodium in liquid ammonia at a temperature between −60° C.

and −10° C. to form the corresponding 6,8-dimercaptooctanoic acid of formula VIII and reacting the compound of formula VIII in alkaline solutin with an iron (III) salt and oxygen to the thioctic acid of formula IX.

2. A 6,6,8-trihydrocarbyl thiooctanoic acid of formula VII



VII

where R is C_1–C_4 alkyl, phenyl or benzyl.

4,705,868

PROCESS FOR THE PREPARATION OF EPOXIDIZED ORGANOSILICON COMPOUNDS

Ulrich Deschler, Hanau; Andreas Grund, Darmstadt, and Guenter Prescher, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

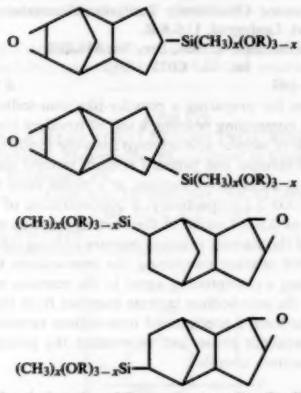
Filed Jul. 30, 1986, Ser. No. 890,448

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1985, 3528006

Int. Cl.[4] C07D *303/02;* **C07F** *7/02, 7/08, 7/18*

U.S. Cl. 549—215 **13 Claims**

11. An isomer mixture of epoxysilanes of the formulas:



A

B

C

D

in which x is 1 or 2 and R represents a C_1–C_6 alkyl or aryl.

4,705,869

PREPARATION OF FATTY ACID ESTERS OF ASCORBIC ACID

Helmut Nickels, Mutterstadt, and Alfred Hackenberger, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 587,115, Mar. 7, 1984, abandoned. This application Aug. 2, 1985, Ser. No. 762,031

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1983, 3308922

Int. Cl.[4] C07D *307/62*

U.S. Cl. 549—317 **14 Claims**

1. A process for the preparation of a fatty acid ester of ascorbic acid, wherein a homogeneous mixture of:

(a) ascorbic acid;

(b) concentrated sulfuric acid having a concentration higher than 96%; and

(c) a methyl ester, an ethyl ester or a mixture thereof of a saturated fatty acid of 12 to 18 carbon atoms;

is reacted at a temperature of from 20° to 50° C.

4,705,870

TOLAN-TYPE NEMATIC LIQUID CRYSTALLINE COMPOUNDS

Haruyoshi Takatsu, Kodaira; Makoto Sasaki, Urawa; Yasuyuki Tanaka, and Hisato Sato, both of Tokyo, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

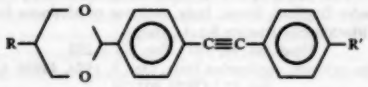
Division of Ser. No. 692,570, Jan. 18, 1985. This application Feb. 11, 1987, Ser. No. 14,257

Claims priority, application Japan, Jan. 23, 1984, 59-8519; Jan. 24, 1984, 59-10658; Mar. 29, 1984, 59-59588; Mar. 29, 1984, 59-59589; Jun. 19, 1984, 59-124489; Dec. 11, 1984, 59-261413; Dec. 11, 1984, 59-261414

Int. Cl.[4] C07D *319/06;* **C09K** *19/34, 19/54, 19/06*

U.S. Cl. 549—369 **5 Claims**

1. A compound of the general formula



wherein R represents a linear alkyl group having 1 to 10 carbon atoms, R′ represents a halogen atom or a linear alkyl group having 1 to 10 carbon atoms, and the dioxane ring has a trans configuration.

4,705,871

ARALKOXY AND ARYLOXYALKOXY KOJIC ACID DERIVATIVES

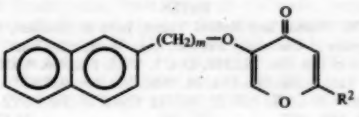
Miyano Masateru, Northbrook, and Robert L. Shone, Palatine, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 629,916, Jul. 11, 1984, Pat. No. 4,644,071. This application Aug. 8, 1986, Ser. No. 894,591

Int. Cl.[4] C07D *309/32*

U.S. Cl. 549—417 **4 Claims**

1. A compound of the formula:



wherein R^2 is:

(a) CH_2OH;

(b) $CH{=}O$; or

(c) $COOR^6$;

wherein R^6 is:

(a) hydrogen;

(b) alkyl of 1 to 6 carbon atoms, inclusive;

(c) alkali metal ion; or

(d) $R^7R^8R^9R^{10}N^+$;

wherein R^7, R^8, R^9, and R^{10}, each being the same or different, are:

(a) hydrogen; or

(b) alkyl of 1 to 6 carbon atoms, inclusive;

wherein m is an integer from 1 to 10, inclusive.

4,705,872

CYCLIC ACETAL-ALCOHOLS

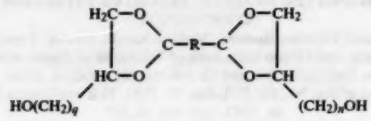
Gerald C. Kolb, Bay City, and Thomas W. Regulski, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 30, 1982, Ser. No. 431,902

Int. Cl.[4] C07D *317/20*

U.S. Cl. 549—448 **2 Claims**

1. A cyclic acetal-alcohol of the formula:



wherein R is cyclohexylene, methylcyclohexylene, or norbornylene; and n and q are independently at least 1.

4,705,873

DERIVATIVES OF 2-AMINO-THIAZOLE HAVING AN ACID SECRETION INHIBITING ACTIVITY

Alessandro Baglioni, Rome, Italy, assignor to Medosan Industrie Biochimiche Riunite S.p.A., Italy

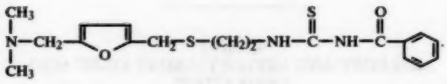
Filed Jan. 14, 1987, Ser. No. 3,258

Claims priority, application Italy, Oct. 5, 1984, 48956 A/84

Int. Cl.[4] C07D *307/54*

U.S. Cl. 549—494 **1 Claim**

1. The intermediate compound N-benzoyl-N'-(2-(((5-(dimethylamino)methyl-2-furanyl)methyl)thio)ethyl)-thiourea of formula



4,705,874

SYNTHESIS OF NEW LIQUID CRYSTAL MATERIALS POSSESSING PHENYLBENZOATE OR BIPHENYL CORE UNITS AND (2,3)-EPOXYALKYLOXIRANEMETHANOL CHIRAL TAILS

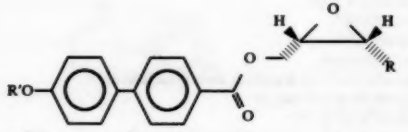
David M. Walba, and Rohini Vohra, both of Boulder, Colo., assignors to University Patents, Inc., Westport, Conn.

Division of Ser. No. 782,348, Oct. 1, 1985, Pat. No. 4,638,073. This application Oct. 31, 1986, Ser. No. 925,937

Int. Cl.[4] C07D *303/12, 303/32;* C09K *19/34, 19/12*

U.S. Cl. 549—557 **24 Claims**

1. A compound of the formula:



wherein R is an alkyl of one to seven carbon atoms, and R' is an alkyl of five to twelve carbon atoms.

4,705,875

SUBSTITUTED FRUCTOSE COMPOUNDS AND VITAMIN SUPPLEMENTS AND METHODS FOR MAKING SAME

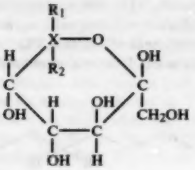
David C. Mitchell, 2472 S. 9th East #8, Salt Lake City, Utah 84106

Division of Ser. No. 620,131, Jun. 13, 1984, Pat. No. 4,588,717. This application Apr. 1, 1986, Ser. No. 847,423

Int. Cl.[4] C07F *11/00, 9/50, 13/00, 9/00*

U.S. Cl. 556—46 **7 Claims**

1. A compound of the formula:



wherein:

X is capable of assuming a +2 or +4 oxidation state and is selected from the group of elements, except carbon, having some nutritional value to animals or plants; and

R_1 and R_2 are nothing —H, or —OH such that:

(1) if R_1 is nothing, R_2 is nothing;
(2) if R_2 is nothing, R_1 is nothing;
(3) if R_1 is —H, R_2 is —OH;
(4) if R_2 is —H, R_1 is —OH;
(5) if R_1 is —OH, R_2 is —H; and
(6) if R_2 is —OH, R_1 is —H.

4,705,876

PROCESS FOR PREPARING POWDER-LIKE IRON-SODIUM TARTRATE COMPLEX

Mikhail A. Ivanov; Jury A. Komkov, and Vera V. Fomina, all of Leningrad, U.S.S.R., assignors to Vsesojuznoe Nauchno-Proizvodstvennoe Obiedinenie Tselljuloznobumazhnoy Promyshlennosti, Leningrad, U.S.S.R.

Filed Jan. 6, 1986, Ser. No. 816,202

Int. Cl.[4] C07F *15/02*

U.S. Cl. 556—149 **6 Claims**

1. A process for preparing a powder-like iron-sodium tartrate complex comprising reacting a salt of trivalent iron with at least one salt of tartaric acid selected from the group consisting of sodium tartrate and primary sodium tartrate and mixtures thereof in an aqueous medium at a molar ratio of said reactants of 1:3.0–3.3 respectively, a concentration of salt of trivalent iron of 0.5–0.7 mol/l of the starting reaction mixture and at a pH of the starting reaction mixture of from 0.8–5.5 to form a reaction mixture containing the iron-sodium tartrate complex; adding a precipitating agent to the reaction mixture to precipitate the iron-sodium tartrate complex from the reaction mixture to form a precipitated iron-sodium tartrate complex and an aqueous phase and recovering the precipitated iron-sodium tartrate complex.

4,705,877

NOVEL AMINOHYDROCARBYL-SUBSTITUTED KETOXIMOSILANES

Gerald A. Gornowicz, and Chi-Long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 25, 1987, Ser. No. 18,674

Int. Cl.[4] C07F *7/10*

U.S. Cl. 556—422 **4 Claims**

1. A silane represented by the formula

$$(RR'C{=}NO)_xR''_{(3-x)}SiR'''NHR''''$$

where R and R' represent identical or different monovalent hydrocarbon radicals, R'' represents a monovalent hydrocarbon radical, a monovalent fluorinated hydrocarbon radical, or an alkoxy group containing from 1 to 4 carbon atoms, with the proviso that when more than one R'' substituent is present these substituents can be identical or different, R''' represents a divalent hydrocarbon radical, R'''' represents a monovalent hydrocarbon radical or a hydrogen atom, and x represents the integer 1, 2 or 3.

4,705,878

METHOD FOR PREPARING AMINOHYDROCARBYL-SUBSTITUTED KETOXIMOSILANES

Gerald A. Gornowicz, and Chi-Long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 25, 1987, Ser. No. 18,675
Int. Cl.[4] C07F 7/08
U.S. Cl. 556—422 4 Claims

1. A method for preparing an organosilane represented by the formula

$$(RR'C{=}NO)R''_2SiR'''NR''''H,$$

where R and R' represent identical or different monovalent hydrocarbon radicals, the two R'' substituents individually represent a monovalent hydrocarbon radical, a monovalent fluorinated hydrocarbon radical or an alkoxy group, R''' represents an alkylene radical containing from 3 to 6 carbon atoms, and R'''' represents a monovalent hydrocarbon radical or a hydrogen atom, said method comprising the steps of

(1) reacting under a substantially anhydrous, inert atmosphere and at a temperature of from 30 to 100 degrees C. a ketoxime of the formula RR'C=NOH and an organosilicon compound of the formula

for a sufficient time to form said organosilane, and

(2) isolating said organosilane from the reaction mixture.

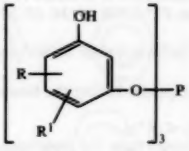
4,705,879

LONG-CHAIN ALKYLRESORCINOL PHOSPHITES

Hans Dressler, Monroeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jan. 13, 1986, Ser. No. 817,899
Int. Cl.[4] C07F 9/145
U.S. Cl. 558—194 10 Claims

1. Compounds of the formula



wherein R is selected from H and alkyl, and R^1 is an alkyl, said alkyls having from 8 to 18 carbon atoms.

4,705,880

CARBONYLATION OF MERCAPTANS

Howard Alper, Ottawa, Canada, and David J. H. Smith, Camberley, England, assignors to The British Petroleum Company p.l.c., London, England

Filed Jun. 3, 1986, Ser. No. 870,187
Claims priority, application United Kingdom, Jun. 4, 1985, 8514008
Int. Cl.[4] C07C 153/017, 153/023
U.S. Cl. 558—257 10 Claims

1. A process for the production of thioesters of the formula R COS R from a mercaptan of the formula RSH wherein R is a benzylic, aromatic or aliphatic moiety which process comprises reacting the mercaptan with carbon monoxide

in the presence of a catalyst system comprising a polyunsaturated olefinic hydrocarbon catalyst component and a metal catalyst component selected from the group consisting of iron, cobalt, nickel, molybdenum, ruthenium, rhodium and iridium, the metal component being in free or combined form.

4,705,881

CONTINUOUS HYDROCYANATION PROCESS USING ZINC HALIDE PROMOTER

Morris Rapoport, Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 17, 1986, Ser. No. 930,940
Int. Cl.[4] C07C 120/02
U.S. Cl. 558—338 4 Claims

1. A continuous process for the hydrocyanation of non-conjugated, ethylenically unsaturated organic nitriles having 5 carbon atoms to produce adiponitrile which process comprises continuously feeding the unsaturated nitriles, hydrogen cyanide, a zero-valent nickel ligand-containing catalyst having the general formula NiL_4 where L is $P(OAr)_3$ and Ar is an aryl or substituted aryl group having up to 18 carbon atoms and zinc chloride promoter, into a reaction vessel maintained at a temperature above about 25° C. but less than about 75° C., controlling the amount of hydrogen cyanide relative to other compounds participating in the reaction such that the overall feed mol ratio of hydrogen cyanide to unsaturated nitrile is in the range of about 0.35/1 to 0.8/1, the overall feed mol ratio of hydrogen cyanide to zero-valent nickel catalyst in the range of about 10/1 to 116/1 and the overall feed mol ratio of hydrogen cyanide to promoter in the range about 30/1 to 800/1 and the molar ratio of total ligand to zero-valent nickel introduced as a catalyst in the range of about 5.4 to 8.2, and continuously withdrawing from the reaction vessel a mixture containing adiponitrile.

4,705,882

N-NAPHTHOYLGLYCINE DERIVATIVES

Kazimir Sestanj, St. Laurent; Nedumparambil A. Abraham, Dollard des Ormeaux; Francesco Bellini, Mount Royal, and Adi Treasurywala, Point Claire, all of Canada, assignors to Ayerst, McKenna & Harrison, Inc., Montreal, Canada

Division of Ser. No. 756,139, Jul. 17, 1985, Pat. No. 4,600,724, which is a division of Ser. No. 530,457, Sep. 9, 1983, Pat. No. 4,568,693, which is a division of Ser. No. 321,306, Nov. 13, 1981, Pat. No. 4,439,617. This application Mar. 28, 1986, Ser. No. 845,230
Claims priority, application Canada, Mar. 2, 1981, 372119
The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.
Int. Cl.[4] C07C 153/063
U.S. Cl. 560—10 1 Claim

1. N-[(5-Chloro-1-naphthalenyl)thioxomethyl]-N-methylglycine, or the corresponding methyl ester thereof.

4,705,883

CARBONYLATION PROCESS

John H. Grate; David R. Hamm, both of Mountain View, Calif., and Donald H. Valentine, Ridgefield, Conn., assignors to Catalytica Associates, Mountain View, Calif. and Haldor Topsoe, Copenhagen, Denmark

Continuation-in-part of Ser. No. 532,784, Sep. 16, 1983, Pat. No. 4,600,793, and a continuation-in-part of Ser. No. 532,785, Sep. 16, 1983, Pat. No. 4,603,216, and a continuation-in-part of Ser. No. 707,885, Mar. 4, 1985, Pat. No. 4,629,804, and a continuation-in-part of Ser. No. 744,951, Jun. 17, 1985, and a continuation-in-part of Ser. No. 806,389, Dec. 9, 1985. This application Jan. 24, 1986, Ser. No. 820,850
The portion of the term of this patent subsequent to Jul. 15, 2003, has been disclaimed.
Int. Cl.[4] C07C 125/065, 125/073
U.S. Cl. 560—25 19 Claims

1. A process for reacting a solution containing a nitrogen-

containing organic compound, selected from the group consisting of nitro, nitroso, azo and azoxy compounds, with carbon monoxide to obtain a carbamic acid derivative selected from the group consisting of urethane and N,N'-disubstituted urea, which comprises providing a primary amine in said solution and reacting said nitrogen-containing organic compound with carbon monoxide in the presence of a catalyst selected from the group consisting of ruthenium and rhodium, and essentially free of redox-active metal components; with the proviso that, in a batch process, when said carbamic acid derivative is an N,N'-disubstituted urea and said primary amine is provided by the in-situ reduction of the nitrogen-containing organic compound, by hydrogen, to said primary amine, then from 50 to about 60 percent of said nitrogen-containing organic compound is hydrogenated to maximize the yield of said N,N'-disubstituted urea.

4,705,884

FLUORINE-SUBSTITUTED PHENYL BENZOATES AND PROCESS FOR PRODUCING SAME

Masakatsu Matsumoto, Sagamihara, and Yasunobu Nishimura, Kamifuknoka, both of Japan, assignors to Sagami Chemical Research Center, Tokyo and Central Glass Company, Limited, Yamaguchi, both of, Japan

PCT No. PCT/JP85/00556, § 371 Date Jun. 5, 1986, § 102(e) Date Jun. 5, 1986, PCT Pub. No. WO86/02067, PCT Pub. Date Apr. 10, 1986

PCT Filed Oct. 8, 1985, Ser. No. 878,862

Claims priority, application Japan, Oct. 8, 1984, 59-209895

Int. Cl.[4] C07C *69/76*

U.S. Cl. 560—109 **5 Claims**

1. A fluorine-substituted phenyl benzoate having the general formula

$$Ar—CO_2—Ar' \qquad (I)$$

wherein one of either Ar or Ar' is a member selected from the group consisting of the p- and o-fluorophenyl groups, and the other is m-fluorophenyl group.

4,705,885

POLYMERIZABLE CARBAMOYLOXYALKYLDICARBOXYLIC ACID ESTERS CARRYING HYDROXYL GROUPS, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Christoph Just, Niedernhausen/Taunus; Dieter Plath, and Gerd Walz, both of Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany

Filed Feb. 6, 1986, Ser. No. 826,790

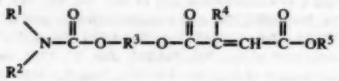
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1985, 3504336

The portion of the term of this patent subsequent to Nov. 3, 2004, has been disclaimed.

Int. Cl.[4] C07C *125/06*

U.S. Cl. 560—158 **15 Claims**

1. A polymerizable carbamoyloxyalkyldicarboxylic acid ester, carrying hydroxyl groups, of the formula (I)

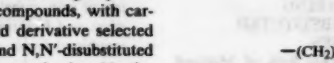


(I)

in which

R^1 represents hydrogen or alkyl or hydroxyalkyl having in each case 1 to 30 carbon atoms in the alkyl radical,

R^2 denotes alkyl or hydroxyalkyl having in each case 1 to 30 carbon atoms in the alkyl radical, or the radical



subject to the proviso that R^1 is hydrogen and x is an integer from 2 to 10,

R^3 represents linear or branched alkylene having 2 to 5 carbon atoms,

R^4 represents hydrogen or methyl and

R^5 represents hydroxyalkyl or hydroxyaminoalkyl having in each case 2 to 20 carbon atoms in the alkyl radical or an alkyl radical of this type which also contains ester or ether groups or both.

4,705,886

PRECURSOR TO NUCLEIC ACID PROBE

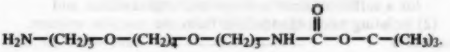
Corey H. Levenson, Oakland, and Kary B. Mullis, Kensington, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Division of Ser. No. 791,332, Oct. 25, 1985, Pat. No. 4,617,261, which is a continuation-in-part of Ser. No. 683,263, Dec. 18, 1984, Pat. No. 4,582,789, which is a continuation-in-part of Ser. No. 591,811, Mar. 21, 1984, abandoned. This application Jul. 21, 1986, Ser. No. 888,252

Int. Cl.[4] C07C *125/065*

U.S. Cl. 560—159 **1 Claim**

1. A composition of matter useful for preparing a nucleic acid probe comprising a compound of the formula:



4,705,887

AROMATIC POLYVINYL ETHERS AND HEAT CURABLE MOLDING COMPOSITIONS OBTAINED THEREFROM

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 459,442, Jan. 20, 1983, Pat. No. 4,518,788. This application Apr. 1, 1985, Ser. No. 718,595

Int. Cl.[4] C07C *69/34, 69/52*

U.S. Cl. 560—190 **2 Claims**

1. An aromatic polyvinylether in the form of a reaction product of

(A) polyvinyl compound having the formula,

$$R[GR^1OC(R^2)=C(R^3)_2]_n,$$

where G is selected from the class consisting of —O—,

and mixtures thereof, R is a polyvalent aromatic orgmanic radical, R^1 is a $C_{(1-8)}$ alkylene radical, R^2 and R^3 are the same or different monovalent radicals selected from hydrogen, halogen and $C_{(1-8)}$ alkyl radicals, and n is an integer equal to 2–10 inclusive, and

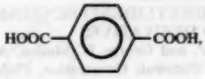
(B) from 0.1 to 1 mole, per mole of said polyvinyl compound of an active hydrogen compound selected from the class consisting of

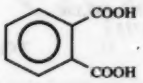
(a) carboxylic acids selected from the class consisting of,

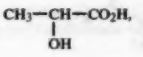
$$HO_2C(—CH_2)_4—CO_2H,$$

$$HO_2C(—CH_2)_6CO_2H,$$

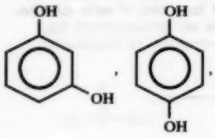
$$HO_2C(—CH_2)_8—CO_2H,$$

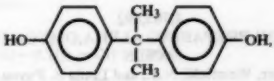


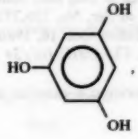


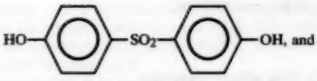


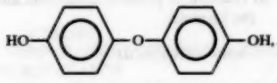
(b) aryl polyols, selected from the class consisting of,



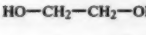


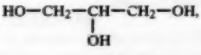


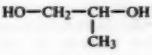


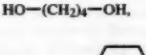


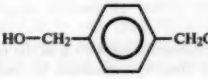
(c) alkanols, selected from the class consisting of,











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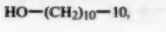
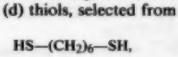
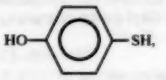
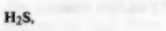


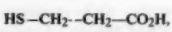
sucrose, glucose, cellulose,

(d) thiols, selected from the class consisting of,

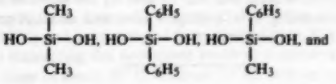


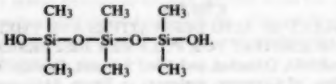






(e) silanes, selected from the class consisting of,





4,705,888

T-ALKENYL PEROXY ESTERS

John Meijer, Deventer; Hans Westmijze, and Eltjo Boelema, both of Bathmen, all of Netherlands, assignors to Akzo NV, Arnhem, Netherlands

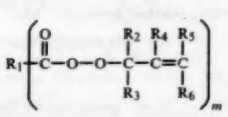
Filed Sep. 4, 1986, Ser. No. 903,955

Claims priority, application Netherlands, Sep. 30, 1985, 8502661

Int. Cl.[4] C07C *179/18*

U.S. Cl. 560—302 **4 Claims**

1. A compound of the formula:



I

wherein

m=1 or 2, and

when

m=1, R_1 is selected from the group consisting of

a cyclohexyl group,

a cyclohexenyl group,

an unsubstituted phenyl group,

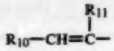
a phenyl group which is substituted with at least one substituent selected from the group consisting of chlorine atoms and methyl groups,

a group

wherein R_7 and R_8 are selected from the group consisting of a hydrogen atom and an alkyl group containing 1–10 carbon atoms, and R_9 is selected from the group consisting

of a hydrogen atom, an alkyl group containing 1–10 carbon atoms, an alkoxy group containing 1–6 carbon atoms, a phenyl group, a phenoxy group and

a group



wherein R_{10} and R_{11} are selected from the group consisting of a hydrogen atom and an alkyl group containing 1–4 carbon atoms;

when

m=2, R_1 is selected from the group consisting of

an alkylene group containing 1–11 carbon atoms,

a cyclohexylene group,

a phenylene group and

a group of the formula $—CH_2—O—CH_2—$;

R_2 and R_3 are selected from the group consisting of an alkyl group containing 1–4 carbon atoms and, together, represent a pentamethylene bridge; and R_4, R_5 and R_6 are selected from the group consisting of a hydrogen atom and an alkyl group containing 1–4 carbon atoms.

4,705,889

AMINOSUCCINIC ACID DERIVATIVES AND THEIR USE AS EMULSIFIERS FOR POLYMER DISPERSIONS

Udo W. Hendricks, Odenthal, and Adolf Schmidt, Colonge, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

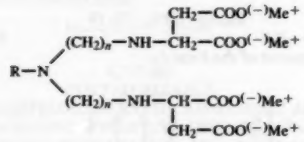
Filed Mar. 7, 1986, Ser. No. 837,157

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1985, 3509822

Int. Cl.[4] C07C *101/26*

U.S. Cl. 562—564 **1 Claim**

1. Aminosuccinic acid derivatives corresponding to the following general formula (I):



wherein

R represents an alkyl or alkenyl group having from 10 to 22 carbon atoms which may be branched and/or interrupted by one or more oxygen atoms;

n represents the number 2 or 3; and

Me^{30} represents hydrogen or a monovalent cation or 2 Me^{2+} represents a divalent cation.

4,705,890

CARBONYLATION PROCESS FOR THE PRODUCTION OF AROMATIC ACIDS

Guy R. Steinmetz, and Mark Rule, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 17, 1987, Ser. No. 26,916

Int. Cl.[4] C07C *51/10*

U.S. Cl. 562—406 **13 Claims**

1. A process for the production of aromatic carboxylic acids which comprises carbonylating aromatic iodides in the presence of carbon monoxide, a catalytic amount of a ruthenium catalyst, a Bronsted base and a catalytic amount of an alkali or alkaline earth metal iodide under aromatic carboxylic acid forming conditions of temperature and pressure.

4,705,891

SUBSTITUTED α-[2'-TRICYCLO[3.3.1.1^{3,7}]DECYLIDENE}-BENZENEACETIC ACID DERIVATIVES

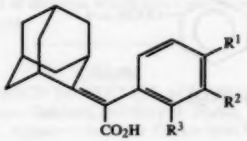
Vassil S. Georgiev, Rochester, and George B. Mullen, Avon, both of N.Y., assignors to Penwalt Corporation, Philadelphia, Pa.

Filed May 27, 1986, Ser. No. 867,130

Int. Cl.[4] C07C *63/33*

U.S. Cl. 562—491 **7 Claims**

1. A compound of the formula:



where the R^1, R^2 and R^3 substituents are independently selected from hydrogen, lower alkyl, lower alkoxy, halogen and trifluoromethane, provided that at least one of such substituents is hydrogen.

4,705,892

PROCESS FOR PREPARING ALPHA,OMEGA-DIAMINO ACIDS

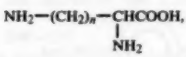
Joshua S. Boger, Westfield, N.J., and Linda S. Payne, Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.Y.

Continuation-in-part of Ser. No. 736,733, May 22, 1985, abandoned. This application Oct. 16, 1986, Ser. No. 915,829

Int. Cl.[4] C07C *101/24*

U.S. Cl. 562—562 **7 Claims**

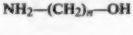
1. A process for preparing α,ω-diamino acids of the formula:



(I)

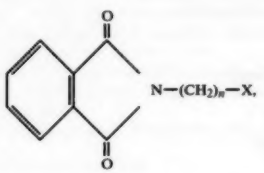
wherein n is 3-10, which comprises:

(a) reaction of phthalic anhydride and an amino alcohol of the formula:



in a hydrocarbon solvent, with the azeotropic removal of the water formed during the reaction;

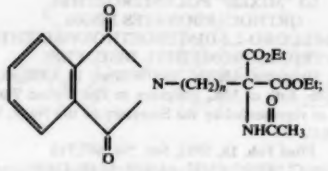
(b) treatment of the reaction product from step "a" with PBr_3 or PCl_5 to obtain:



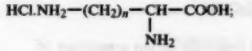
(B)

wherein X is Cl or Br;

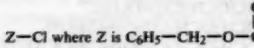
(c) alkylating diethyl acetamidomalonate with B in the presence of sodium hydride in dimethylformamide to obtain:


(C)

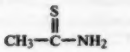
(d) hydrolyzing and decarboxylating C to obtain:


(D)

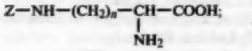
(e) chelating D with $CuCl_2$, acylating the chelate with benzylchloroformate of the formula:



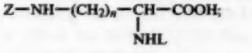
and decomposing the acylated chelate with alkaline thioacetamide of the formula:



to obtain:


(E)

(f) acylating E to obtain the N-protected derivative of the formula:


(F)

wherein L is a urethane-type protecting group selected from the group consisting of tert-butyloxycarbonyl, benzyloxycarbonyl, furfuryloxycarbonyl, and diisopropylmethyloxy carbonyl; and

(g) deprotecting F to obtain an α,ω-amino acid of formula I.

4,705,893

PROCESS FOR THE PREPARATION OF AMPHOTERIC SURFACTANTS

Koshiro Sotoya; Makoto Kubo, and Kazuhiko Okabe, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Nov. 14, 1986, Ser. No. 931,372
Claims priority, application Japan, Nov. 25, 1985, 60-264492
Int. Cl.[4] C07C *103/183*
U.S. Cl. 562—564 **3 Claims**

1. A process for the preparation of an amphoteric surfactant comprising reacting an alkylimidazoline or an open-ring derivative thereof with a monohaloacetic acid or a salt thereof in the presence of an alkali in a water/lower alcohol mixture, characterized by carrying out the reaction by using (a) an alkylimidazoline or an open-ring derivative thereof, (b) a lower alcohol and (c) water each in such an amount that the composition by weight of the components (a), (b) and (c) is within a pentagon defined by points (80,10,10), (80,15,5), (40,55,5), (40,27.5,32.5) and (52.5,10, 37.5) in triangular coordinates wherein each of the components (a), (b) and (c) is placed at each of the three vertices of said coordinates, with the proviso that the amount of water does not include the one required for the ring opening of the alkylimidazoline, and removing precipitated inorganic salts by filtration.

4,705,894

PROCESS FOR RECOVERY OF ORGANIC ACIDS FROM AQUEOUS SOLUTIONS

Yuanfu Su, and Yuming Jiang, both of 22 Fl., Wu Sang House, 655 Nathan Road, Kowloon, Hong Kong

Continuation-in-part of Ser. No. 584,899, Feb. 29, 1984. This application Mar. 21, 1986, Ser. No. 842,489
Int. Cl.[4] C07C *59/265*
U.S. Cl. 562—580 **4 Claims**

1. A process for the recovery of a carboxylic acid selected from the group consisting of citric acid, malic acid, tartaric acid and oxalic acid from fermentation broths wherein the concentrations of the carboxylic acid is from about 2 to about 30 percent by weight, comprising the steps:

(a) Pretreating the fermentation broth at a temperature in the range of about 40° C. and 80° C. with granular active carbon with a particle size in the range between 20 to 100 mesh, and a specific surface area of from 1500 to 3000 M^2/g and a porosity of from about 5A to 20A;

(b) Extracting the pretreated broth at a temperature in the range of about 10° C. to about 35° C. with an extractant in a water immiscible solvent selected from the group consisting of aliphatic hydrocarbons, aromatic hydrocarbons, kerosine, sulfonated kerosine and ethers, the extractant being

a mixture of trialkyl phosphine oxides having a total of 15 to 27 carbon atoms and wherein R^1, R^2 and R^3 are the same or different alkyl groups of 5 to 9 carbon atoms; and

(c) re-extracting the extract with distilled water at a temperature in the range of from about 5° C. to about 90° C.

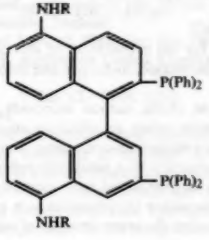
4,705,895

5,5'-DIAMINO OR 5,5'-DIACETAMIDO-2,2'-BIS(DIPHENYLPHOSPHINO)-1,1'-BINAPHTHYLS

Tamon Okano, Canberra, Australia; Hidenori Kumobayashi; Susumu Akutagawa, both of Kanagawa, Japan; Jitsuo Kiji, Tottori, Japan; Hisatoshi Konishi, Tottori, Japan; Keiichi Fukuyama, Tottori, Japan, and Yasunobu Shimano, Okayama, Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1986, Ser. No. 937,805
Claims priority, application Japan, Feb. 1, 1986, 61-19203
Int. Cl.[4] C07F *9/50*
U.S. Cl. 564—15 **1 Claim**

1. A phosphine compound represented by formula:



wherein R represents a hydrogen atom or an acetyl group; and Ph represents a phenyl group.

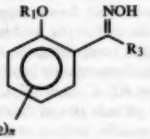
4,705,896

NOVEL EXTRACTANTS FOR THE RECOVERY OF PALLADIUM

Michael Van Der Puy; David S. Soriano, both of Cheektowaga, and Jeffrey H. Dimmit, Williamsville, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 25, 1984, Ser. No. 624,068
Int. Cl.[4] C07C *131/00*
U.S. Cl. 564—265 12 Claims

1. A compound of the formula:



wherein:

n is an integer of from 1 to 4;

R_1 is alkyl from 1 to 6 carbon atoms, cycloalkyl, or aralkyl;

R_2 is nitro, halogen, hydrogen or substituted or unsubstituted alkyl, alkoxy, aryloxy, cycloalkyl, aryl, aralkyl or alkaryl wherein permissible substituents are those which are inert under the use conditions of the compounds when extracting and isolating palladium metal values; and

R_3 is alkyl having from 12 to 25 carbon atoms, either unsubstituted or substituted with one or more of the aforementioned permissible subsituents.

4,705,897

PROCESS FOR PRODUCING BICYCLIC DIAMINES

David C. Alexander, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed May 5, 1986, Ser. No. 859,559
Int. Cl.[4] C07C *101/72*
U.S. Cl. 564—445 15 Claims

1. A one step process for preparing bicyclic diamines which comprises reacting 5-vinyl-2-norbornene, synthesis gas and an amine from the group consisting of primary amines and secondary amines in the presence of a catalyst comprising a ruthenium-containing compound, an amide solvent and, optionally, a quaternary phosphonium salt.

4,705,898

PREPARATION OF DISECONDARY AMINES FROM DIOLEFINS AND PRIMARY AMINES

Edward E. McEntire, Kennett Square, Pa., and John F. Knifton, Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 4, 1986, Ser. No. 848,173
Int. Cl.[4] C07C *85/00*
U.S. Cl. 564—467 18 Claims

1. A process for the preparation of secondary amines from olefins, carbon monoxide, hydrogen and primary amines, comprising

(a) reacting an olefin, carbon monoxide, hydrogen and a primary amine using an effective amount of a catalyst comprising a ruthenium-containing compound in the presence of a quantity of a trialkylphosphine or triarylphosphine such that the initial mole ratio of trialkylphosphine or triarylphosphine to ruthenium is in excess of 80:1, and

(b) hydrogenating the imine product of step (a) to a secondary amine.

4,705,899

1:3 "MIXED" POLYNITROETHYL ORTHOCARBONATES FROM TRIS(2-FLUORO-2,2-DINITROETHOXY)METHYL TRICHLOROMETHYL DISULFIDE

Michael E. Sitzmann, Adelphi, and William H. Gilligan, Fort Washington, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 18, 1983, Ser. No. 467,713
Int. Cl.[4] C07C *43/32, 43/317;* C06B *25/00*
U.S. Cl. 568—590 10 Claims

1. An orthocarbonate of the formula

$$[CF(NO_2)_2CH_2O]_3COR$$

wherein R is selected from the group consisting of
$-CH_2C(NO_2)_3$,
$-CH_2C(NO_2)_2CH_3$,
$-CH_2CF_2NO_2$,
$-CH_2C(NO_2)_2CH_2OH$,
$-CH_2C(NO_2)_2CH_2OC[OCH_2CF(NO_2)_2]_3$,
$-CH_2C(NO_2)_2CH_2OCH_2OCH_2C(NO_2)_2CH_2OH$,
$-CH_2C(NO_2)_2CH_2OCH_2OCH_2C(NO_2)_2CH_2OC[OCH_2CF(NO_2)_2]_3$,
$-CH_2CF_3$, and
$-CH_2CH_3$.

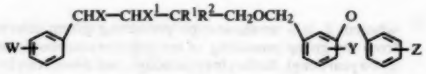
4,705,900

INSECTICIDAL ALKENES

Alan J. Whittle, Aldershot, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Sep. 3, 1986, Ser. No. 903,244
Claims priority, application United Kingdom, Sep. 23, 1985, 8523464
Int. Cl.[4] C07C *43/215*
U.S. Cl. 568—637 7 Claims

1. A compound of formula:



wherein W represents hydrogen or one or two substituents selected from halo, alkyl of up to four carbon atoms, alkoxy of up to four carbon atoms, and fluoroalkyl of one or two carbon atoms; X and X^1 together represent a second bond between the adjacent carbon atoms; Y represents hydrogen or halogen; Z represents hydrogen, halogen or lower alkyl; and R^1 and R^2 each represent hydrogen or alkyl of up to four carbon atoms, or R^1 and R^2 together represent an alkylene group of from two to five carbon atoms.

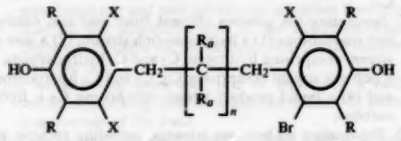
4,705,901

BROMINATED HYDROXYAROMATIC COMPOUNDS

Abel Mendoza, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 773,685, Sep. 9, 1985. This application Aug. 26, 1986, Ser. No. 900,474
Int. Cl.[4] C07C *39/14*
U.S. Cl. 568—729 14 Claims

1. A compound of the formula:



wherein n is zero or a positive integer, each X independently is Br or H, each Ra independently is H or alkyl of up to about 12 carbon atoms, and each R independently is a primary or secondary alkyl moiety of up to about 6 carbon atoms.

4,705,902

DDTR-FREE 1,1-BIS(CHLOROPHENYL)-2,2,2-TRICHLOROETHANOL

Richard W. Nichols, Washington Crossing; William J. Zabrodski, Bensalem, both of Pa., and Abhijit Mitra, Westfield, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 783,392, Oct. 3, 1985, abandoned, which is a division of Ser. No. 740,618, Jun. 3, 1985, abandoned. This application May 15, 1986, Ser. No. 862,001

Int. Cl.[4] **C07C** *29/74, 29/86*

U.S. Cl. 568—810 **29 Claims**

1. A process for preparing DDTr-free 1,1-bis(chlorophenyl)-2,2,2-trichloroethanol from technical 1,1-bis(chlorophenyl)-2,2,2-trichloroethanol which comprises at a temperature of from about −5° C. to about 100° C.:

(a) dissolving technical 1,1-bis(chlorophenyl)-2,2,2-trichloroethanol in a solvent selected from the group (C_1–C_3) alcohol, (C_2–C_6) diol, (C_1–C_3) organic acid, 4-hydroxy-3-methyl-2-butanone, acetone, or mixtures thereof containing up to about 50% water to obtain a solution having a 1,1-bis(chlorophenyl)-2,2,2-trichloroethanol concentration of from about 1% to about 60%; and

(b) extracting the solution with a solvent selected from (C_4–C_{20})alkane, (C_4–C_{20})alkene, (C_6–C_{20})alkadiene, (C_6–C_{10}) single ring aromatic, or mixtures thereof; and

(c) separating the resulting layers; and

(d) removing the solvent from the dicofol containing layer to afford the desired DDTr-free 1,1-bis(chlorophenyl)-2,2,2-trichloroethanol.

4,705,903

CATALYTIC DECOMPOSITION OF IMPURITIES IN TERTIARY BUTYL ALCOHOL

John R. Sanderson, Leander, and John M. Larkin, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 20, 1986, Ser. No. 932,822

Int. Cl.[4] **C07C** *29/88, 29/132, 31/12*

U.S. Cl. 568—922 **6 Claims**

1. A method for enhancing the motor fuel quality of a tertiary butyl alcohol feedstock contaminated with residual quantities of tertiary butyl hydroperoxide and ditertiary butyl peroxide, which comprises the steps of:

a. contacting said feedstock in a reaction zone with a catalyst at a temperature of about 80° to about 220° C. for a period of time sufficient to substantially selectively decompose said tertiary butyl hydroperoxide and said ditertiary butyl peroxide to tertiary butyl alcohol, and

b. recovering substantially hydroperoxide-free tertiary butyl alcohol from the products of said reaction,

c. said catalyst being composed of a metals component consisting essentially of metallic iron, copper, chromium and cobalt or the oxides of one or more of said metals in the proportions, on an oxygen-free basis, of about 20 to about 80 wt. % of iron and about 5 to about 40 wt. % of copper from about 0.1 to about 10 wt. % of chromium and from about 0.01 to about 5 wt. % of cobalt.

4,705,904

VAPOR PHASE SYNTHESIS OF HEXAFLUOROISOBUTYLENE

John H. Bonfield, Basking Ridge, and Harry E. Ulmer, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 580,083, Feb. 14, 1984, abandoned. This application Jan. 17, 1986, Ser. No. 820,896

Int. Cl.[4] **C07C** *17/26*

U.S. Cl. 570—142 **4 Claims**

1. A process for which comprises

(a) contacting, in a catalyst zone B of a reactor, in the vapor phase, a stream comprising hexafluoropropylene oxide with a fluorinated catalyst selected from the group consisting of fluorinated alumina, fluorinated silica-alumina, alkali metal fluoride, on an activated alumina support and mixtures thereof at a temperature in the range of about 400° to about 650° C. for a residence time sufficient to form a vapor stream comprising hexafluroacetone;

(b) directly contacting in a heating zone of the reactor, in the vapor phase the vapor stream comprising hexafluroroacetone with a compound selected from the group consisting of acetic anhydride, acetone, acetic acid, isopropenyl acetate, acetylacetone, diketene and mixtures thereof, at a temperature in the range of about 500° to about 700° for a residence time sufficient to form a stream comprising hexafluoroisobutylene substantially free of perfluoroisobutylene; and

(c) recovering hexafluroroisobutylene product.

4,705,905

TOLAN-TYPE NEMATIC LIQUID CRYSTALLINE COMPOUNDS

Haruyoshi Takatsu, Kodaira; Makoto Sasaki, Urawa; Yasuyuki Tanaka, and Hisato Sato, both of Tokyo, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

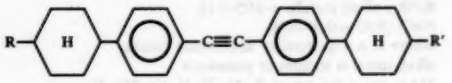
Division of Ser. No. 692,570, Jan. 18, 1985. This application Feb. 11, 1987, Ser. No. 14,262

Claims priority, application Japan, Jan. 23, 1984, 59-8519; Jan. 24, 1984, 59-10658; Mar. 29, 1984, 59-59588; Mar. 29, 1984, 59-59589; Jun. 19, 1984, 59-124489; Dec. 11, 1984, 59-261413; Dec. 11, 1984, 59-261414

Int. Cl.[4] **C07C** *13/18;* **C09K** *19/30, 19/54, 19/06*

U.S. Cl. 585—25 **3 Claims**

1. A compound of the general formula



wherein R and R′, independently from each other, represent a linear alkyl group having 1 to 10 carbon atoms.

4,705,906

SELECTIVE HYDROGENATION OF ACETYLENE

John H. Brophy, Camberley, and Anthony Nock, Sandhurst, both of England, assignors to The British Petroleum Company, p.l.c., London, England

Filed Nov. 12, 1986, Ser. No. 930,003

Claims priority, application United Kingdom, Nov. 27, 1985, 8529245

Int. Cl.[1] **C07C** *5/05*

U.S. Cl. 585—262 **12 Claims**

1. A process for the production of ethylene by the selective hydrogenation of acetylene to ethylene in the presence of carbon monoxide at a concentration of greater than 1% by vol of the total feed, which process comprises contacting a feedstock comprising carbon monoxide, hydrogen, and acetylene, at an elevated temperature in the range from 100° to 500° C. with a catalyst,

wherein the catalyst is zinc oxide or sulphide, either alone or in combination with at least one other metal oxide or sulphide.

4,705,907

PRODUCTION OF LIQUID HYDROCARBON FROM GAS CONTAINING LOWER HYDROCARBON

Tomoyuki Inui, 5-43, Hatoyama 1-chome, Uji-shi, Kyoto 611, Japan, assignor to Showa Shell Sekiyu Kabushiki Kaisha, Tokyo and Tomoyuki Inui, Uji, both of, Japan

Filed May 19, 1986, Ser. No. 864,779

Claims priority, application Japan, May 29, 1985, 60-114259

Int. Cl.[4] C07C *12/02*

U.S. Cl. 585—415 **8 Claims**

1. A process for preparing liquid hydrocarbon from lower hydrocarbon gas which comprises bringing feed gas containing C_2–C_5 paraffinic hydrocarbons, C_2–C_5 olefinic hydrocarbons or mixtures thereof into contact with a metallo-silicate catalyst (Si/Me) wherein the atomic ratio of Si/Me is 15–3500 and Me is selected from the group consisting of B, Al, Ti, Zr, Ge, La, Mn, Cr, Sc, V, Fe, W, Mo, Co, Zn, Ga and Ni, and the acidity per g of catalyst is

total acid: 0.1–4.5 milli-equivalent

strong acid: 0.05–2.0 milli-equivalent and

weak acid: 0.05–3.0 milli-equivalent,

at a temperature of 220°–550° C.,

said catalyst being prepared by the following steps: a first step of preparing solutions of (A), (B) and (C), said (A) being an aqueous solution containing (a) a quaternary lower alkylammonium cation R, (b) an alkaline metal of sodium or potassium, and (c) and aqueous solution of a water soluble salt of a metal Me selected from the group consisting of B, Al, Ti, Zr, Ge, La, Mn, Cr, Sc, V, Fe, W, Mo, Co, Zn, Ga and Ni, (B) an aqueous silicate solution, and (C) an aqueous solution of an ion modifier, and adding the solution (A)and solution (B) to the solution (C) at a constant speed until a gelly mixture having a pH of around 10; a second step of grinding the resulting gel mixture; a third step of heating the gel mixture to a temperature of 150°–190° C. at a constant speed followed by heating to 220° C. at a constant speed or an exponential speed to obtain a precourser synthetic metallosilicate having the following chemical composition in molar ratio:

Si/Me: = 15–3500

OH^-/SiO_2: = 0.3–1.0

H_2O/SiO_2: = 30–100

$R/(R+\text{alkali metal})$: = 0.05–0.15

$NaCl/H_2O$: = 0.01–0.06

where R is a quaternary ammonium cation,

alkali metal is sodium or potassium,

Me is one metal ion of B, Al, Ti, V, Cr, Mn, Fe, Co, Ni, Zn, Ga, Ge, Zr, Mo, W, La or Sc, and fourth step of calcining the precourser.

4,705,908

NATURAL GAS CONVERSION PROCESS

Oliver M. Gondouin, c/o S Cal Research Corp., 32 San Marino Dr., San Rafael, Calif. 94901

Filed Dec. 31, 1984, Ser. No. 688,058

Int. Cl.[4] C07C *2/00*

U.S. Cl. 585—500 **17 Claims**

1. An improved process for converting all natural gas hydrocarbon components with carbon numbers of 1 to 4 into liquid hydrocarbons with carbon numbers equal to or greater than 5, and into a hydrogen-rich gaseous by-product; said process comprising the following steps:

A. Splitting the natural gas feed into a rich gas stream comprising C_2, C_3 and C_4 hydrocarbons and a lean gas stream comprising C_1 and C_2 hydrocarbons;

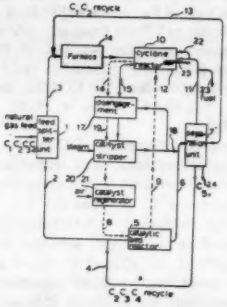
B. Catalytically converting said rich gas stream in a catalytic bed reactor in which the gas-suspended solid phase is a catalyst maintained at a temperature not exceeding 600° C.;

C. Separating the gaseous effluent from said said catalytic bed reactor into (1) a hydrogen-rich stream, (2) a lean gas stream comprising hydrogen, C_1 and C_2 hydrocarbons, (3) a rich gas stream comprising C_2, C_3 and C_4 hydrocarbons and (4) a liquid product stream comprising C_5+ hydrocarbons;

D. Pre-heating all lean gas streams, including recycle, in a furnace;

E. Transferring said catalyst into a short residence time reactor;

F. Reacting an ionized plasma derived from said hydrogen stream with said pre-heated lean gas stream carrying said transferred catalyst in said short residence time reactor at a temperature ranging from 600° C. to 900° C. and at a residence time ranging from 100 to 300 milliseconds, with subsequent quenching of reactions;



G. Separating the gas-solid stream resulting from said reaction into a spent catalyst phase stream and a gaseous effluent stream through disengagement by centrifugal forces;

H. Separating said gaseous effluent stream from said disengagement means into four streams as defined in step C, using the same separation facilities as in step C;

I. Regenerating said spent catalyst stream in a regenerator by combustion of the carbon build-up on said spent catalyst in an oxidizing gas stream;

J. Transferring the regenerated catalyst back into said catalytic bed reactor and into said short residence time reactor;

K. Recycling all rich gas streams obtained in steps C and H back to said catalytic bed reactor;

L. Recycling the lean gas stream obtained in step H back to said pre-heating furnace of step D.

4,705,909

PROCESS FOR THE SEPARATION OF PARA-XYLENE

Tsoung-Y Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 27, 1986, Ser. No. 833,695

Int. Cl.[4] C07C *7/12*

U.S. Cl. 585—828 **13 Claims**

1. In an adsorptive-separation process for the separation of para-xylene from a hydrocarbon feed comprising a mixture of C_8 aromatic isomers which process comprises the steps of:

(a) contacting said hydrocarbon feed, at less than equilbrium adsorption conditions and in the simultaneous presence of a hereinafter specified desorbent with a bed of crystalline aluminosilicate adsorbent, which is effective for selectively adsorbing a C_8 aromatic isomer from a mixture of at least two C_8 aromatic isomers, thereby adsorbing a selectively adsorbed component of the feed within said adsorbent, said adsorbent having been subjected prior to step (a) to at least one cycle of steps (a) to (d) herein, said less

than equilibrium adsorption conditions being further characterized in allowing a competitive adsorption between said desorbent and said selectively adsorbed feed component for the adsorptive sites of the adsorbent whereby desorbent remains within the adsorbent for the duration of this step (a);

(b) withdrawing from said bed of adsorbent a raffinate stream comprising desorbent and less selectively adsorbed components of the feed;

(c) contacting the adsorbent bed with said desorbent at desorption conditions to effect displacing said selectively adsorbed component of the feed from said adsorbent; and

(d) withdrawing from the adsorbent bed an extract stream comprising desorbent and said selectively adsorbed component of the feed;

the improvement which comprises employing water as said desorbent.

4,705,910

TETRAPLOID CORN AND METHODS OF PRODUCTION

Steven C. Price, Cleveland Heights, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Sep. 18, 1985, Ser. No. 777,374

Int. Cl.[4] A01H *1/02*

U.S. Cl. 800—1 **36 Claims**

1. An inbred line of tetraploid corn wherein said inbred line has the characteristics of SX-4-2, SX-4-4, SX-4-16-2, SX-4-32-1, SX-4-33-4-2, SX-5-6, SX-5-11, SX-5-9-1-2, SX-5-13-3, SX-5-14-1-2, SX-6-3, or SX-6-15-2-1.

4,705,911

SOLAR CELL MODULE

Akihiko Nakano, Itami; Takeshi Hibino, Ikoma; Hajime Takata, Neyagawa, and Manabu Yoshida, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 5, 1986, Ser. No. 939,713
Claims priority, application Japan, Dec. 5, 1985, 60-273722
Int. Cl.[4] H01L *25/02*
U.S. Cl. 136—251 8 Claims

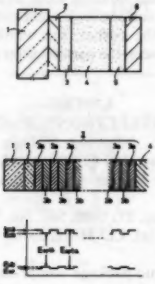
1. A solar cell module comprising a CdS/CdTe junction as a photovoltaic portion and an oxygen releasing agent filled in the module.

4,705,912

PHOTOVOLTAIC DEVICE

Yukio Nakashima, Hirakata; Hisao Haku, Neyagawa; Kaneo Watanabe, Yawata, and Tsugufumi Matsuoka, Neyagawa, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Sep. 19, 1986, Ser. No. 909,255
Claims priority, application Japan, Sep. 27, 1985, 215262
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—258 10 Claims



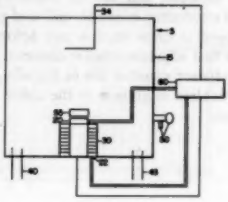
1. A photovoltaic device comprising a transparent first electrode (2), a semiconductive multilayer (3) of one conductivity type on said first transparent electrode (2), said semiconductive multilayer (3) comprising a plurality of amorphous thin constituent layers of different types stacked periodically for forming a periodical band gap profile having a multiplicity of quantum wells for improving the light collection efficiency; a semiconductor layer (4) of an i-type located contiguous to said multilayer (3), said transparent first electrode passing light to said i-type semiconductor layer (4) through said semiconductive multilayer (3), and a second electrode (6) arranged for providing an electrical output when light enters into said photovoltaic device through said first transparent electrode.

4,705,913

AMORPHOUS SILICON DEVICES AND METHOD OF PRODUCING

William P. Campbell, III, 3310 Rowland Pl., Washington, D.C. 20008

Continuation of Ser. No. 735,945, May 20, 1985, abandoned, which is a continuation of Ser. No. 593,376, Mar. 26, 1984, abandoned, which is a continuation of Ser. No. 317,512, Nov. 2, 1981, abandoned. This application Apr. 9, 1986, Ser. No. 850,083
Int. Cl.[4] H01L *31/06, 21/205*
U.S. Cl. 136—258 15 Claims



15. Silicon photovoltaic device comprising:

(a) a substrate comprising an electrically conductive material;

(b) a first semiconductor layer formed on said substrate, said first semiconductor layer being formed by deposition of amorphous silicon in a glow discharge in the presence of a magnetic field, the magnetic field being perpendicular to the substrate surface on which the first semiconductor layer is formed;

(c) a second semiconductor layer formed on said first semiconductor layer, said second semiconductor layer being formed by deposition of amorphous silicon in a glow discharge in the presence of a magnetic field which is reversed in polarity from the magnetic field used in forming the first semiconductor layer; and

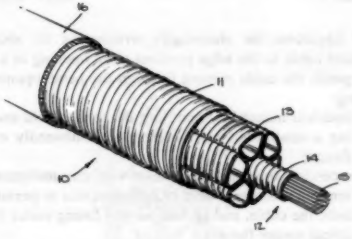
(d) an electrically conducting grid on said second semiconductor layer.

4,705,914

HIGH VOLTAGE FLEXIBLE CABLE FOR PRESSURIZED GAS INSULATED TRANSMISSION LINE

Lewis A. Bondon, 167 Highland Ave., Montclair, N.J. 07042

Continuation of Ser. No. 788,980, Oct. 18, 1985, abandoned. This application Nov. 10, 1986, Ser. No. 928,699
Int. Cl.[4] H01B *9/06*
U.S. Cl. 174—28 9 Claims



1. A high voltage flexible cable for pressurized gas insulated transmission line service comprising in combination a continuous gas-tight cylindrical metallic conductive sheath corrugated circumferentially throughout its length, at least one elongated coextensive conductor member disposed within said sheath and having an outer surface corrugated circumferen-

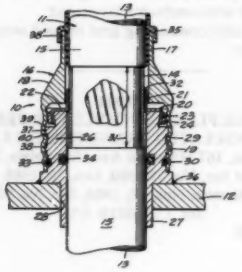
tially throughout its length, and a plurality of tubular elements of electrically insulating material disposed lengthwise of the cable in a transversely packed circumferential array around said conductor member between said sheath and said conductor member, said tubular elements throughout their length being squeezed radially of the cable between said sheath and said conductor member with the roots of said sheath corrugations and the crests of said conductor member corrugations radially indenting said tubular elements at axially spaced intervals sufficient to interlock said tubular elements with both said sheath and said conductor member to resist relative longitudinal movement between said tubular elements and both said sheath and said conductor member, and said tubular elements being dimensioned in cross section and deformed radially of said cable such that adjacent tubular elements circuferentially around the conductor member are in forceful surface contact to prevent particulate migration in the cable radial direction during cable use.

4,705,915

CABLE SHIELD TERMINATION MEANS

Michael K. Van Brunt, 9754 Big Horn, Ventura, Calif. 93004, and Jeffrey J. Hager, 555 Rosewood, #205, Camarillo, Calif. 93010

Filed Jun. 24, 1985, Ser. No. 747,782
Int. Cl.[4] H05K *9/00*
U.S. Cl. 174—35 R **5 Claims**



1. Apparatus for electrically terminating the shield of a shielded cable to the edge portions of an opening in a conductive panel, the cable passing through the panel opening, comprising:

cylindrical means for encircling the cable shield and including a continuous circumferentially outwardly extending flange;

a receiving tube having at least two circumferentially extending recesses, a bore of sufficient size to permit receipt onto the cable, and an end portion fitting under the cylindrical means flange;

a clamping ring received over the flange;

a cylindrical cap having end parts clamped about the ring and deformed into the receiving tube recesses forming a continuous contacting interconnection between the cap, ring and cylindrical means flange; and

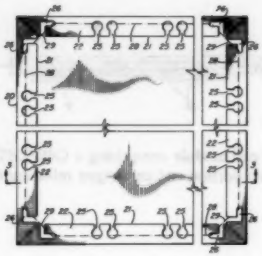
the other end of the receiving tube being dimensioned to enable fitting receipt through the panel opening.

4,705,916

EMI GASKET R"TAINING MECHANISM FOR ELECTRONIC EQUIPMENT

Anil K. Wadhera, Brampton; Alex K. Tang, Mississauga, and Theodore E. Basser, Downsview, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 14, 1986, Ser. No. 829,388
Int. Cl.[4] H05K *9/00*
U.S. Cl. 174—35 GC **2 Claims**



1. In a cabinet for mounting electronic equipment comprising a metal support frame and metal panels adapted to be secured to said frame so as to form a box, each panel comprising an in-turned box flange for mating with the support frame and means interposed between the mating surfaces of the panels and the support frame for attenuating the leakage of electromagnetic energy radiating from the electronic equipment mounted in the frame, the attenuating means comprising, a compressible flexible gasket having a conductive outer surface, at least one of the mating surfaces having a plurality of slots distributed in pairs along its periphery, the gasket being threaded in an over and under manner so that it is on top of the mating surface between the pairs of slots, each slot not adjacent a right-angle corner of the mating surface being in the shape of a keyhole having an annular portion adapted to receive the gasket comfortably and a channel portion having parallel sides spaced apart a distance less than the diameter of the gasket, the gasket holding slots adjacent a right-angle corner of the mating surface each comprising an L-shaped slot leading away from the corner, the width of the slot corresponding to that between the parallel sides of the keyhole slots.

4,705,917

MICROELECTRONIC PACKAGE

Louis E. Gates, Jr., Westlake Village; Albert Kamensky, Redondo Beach, and Don C. Devendorf, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 27, 1985, Ser. No. 770,038
Int. Cl.[4] H01L *23/02*
U.S. Cl. 174—52 FP **22 Claims**

1. A microelectronic package comprising:

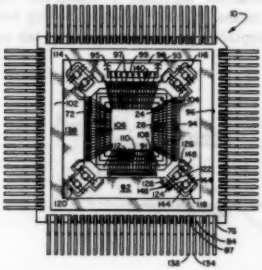
a plurality of metal planes, said plurality of metal planes comprising at least a voltage plane, a ground plane, a base plane and a signal plane, interior openings in said voltage plane, said ground plane and said signal plane defining a microelectronic chip cavity;

said voltage plane, said ground plane and said signal plane each defining electric circuitry;

said voltage plane, said ground plane and said signal plane being stacked on said base plane so that said planes are positioned as a lower plane against said base plane, an intermediate plane against and above said lower plane, an upper plane against and above said intermediate plane;

said openings in said voltage plane, said ground plane and said signal plane being sized so that said opening in said lower plane is smaller than said opening in said intermediate plane and said opening in said intermediate plane is

smaller than said opening in said upper plane so that a ledge for connection to circuitry on said intermediate plane is exposed within said opening in said upper plane and a ledge for connection to circuitry on said lower plane is exposed within said opening in said intermediate plane so that when a microelectronic chip is positioned within the microelectronic chip cavity defined by said interior openings, the microelectronic chip can be connected to



the conductors on the exposed edges in the interior opening of said signal plane, said ground plane and said voltage plane;

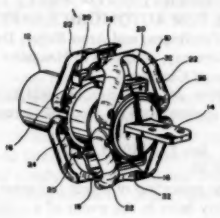
a second voltage plane mounted on top of said signal plane, said second voltage plane having exterior edges which are closer together than the exterior edges of said upper plane so that an exterior ledge carrying circuitry on said upper plane is exposed at the exterior of said package for external connection.

4,705,918

CORONA SHIELD AND TRANSMISSION LINE PROVIDED WITH CORONA SHIELDS

Eldred R. Harmon, Pell City, Ala., assignor to Square D Company, Palatine, Ill.

Filed Jul. 31, 1986, Ser. No. 891,998
Int. Cl.[4] H02G *5/02;* H01T *19/02*
U.S. Cl. 174—73 R **14 Claims**



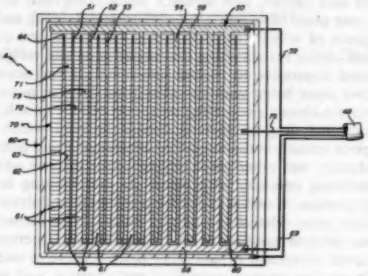
7. A corona shield for protecting a transmission line subassembly from the effects of corona, said shield comprising a member having three sides and a substantially truncated, V-shape, said member having a top side and two legs projecting outwardly therefrom on a same side thereof and at obtuse, inner angles therefrom; the outer and inner sides formed at the juncture of the top side and the legs being rounded and the bottom portions of the legs being rounded, each of said legs having a curve therein such that the top side projects away from the bottom of the legs; each said leg having at the bottom thereof means for securing the member to a transmission line subassembly such that the top side of the member will project over a transmission line subassembly when mounted thereto and thereby protect a portion of the transmission line subassembly from the effects of corona.

4,705,919

ELECTROSTATIC PATTERN-COUPLED DIGITIZER

Satish K. Dhawan, 36 Anita St., New Haven, Conn. 06511

Filed Feb. 21, 1985, Ser. No. 704,329
Int. Cl.[4] G08C *21/00*
U.S. Cl. 178—19 **27 Claims**



1. A digitizer comprising:

A. a digitizer tablet having two electrodes, the first electrode having a pattern that varies with a first coordinate in a two-coordinate system and the second electrode having a pattern that varies with the second coordinate in the two-coordinate system;

B. a cursor movable on the digitizer tablet, the cursor including a coupling electrode for electrostatic field coupling with the first and second patterned electrodes of the digitizer tablet;

C. signal generating means connected for inputting an electrical signal to the coupling electrode of the cursor, thereby establishing electrostatic field coupling with and electrical signals on each of the first and second patterned electrodes, the electrical signals on the first and second patterned elec' 'odes being indicative of the position of the cursor in the two-coordinate system; and

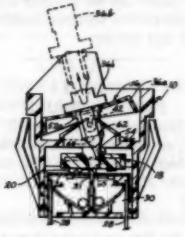
D. electronic means for calculating the coordinates of the cursor in the two-coordinate system from the electrical signals on the first and second patterned electrodes.

4,705,920

ELECTRICAL SWITCH WITH ROCKER ACTUATOR HAVING REMOVABLE LOCKING KEY

Edward V. Sahrbacker, Brecksville, Ohio, assignor to Lucerne Products, Inc., Hudson, Ohio

Filed Apr. 8, 1986, Ser. No. 849,464
Int. Cl.[4] H01H *27/00*
U.S. Cl. 200—43.04 **5 Claims**



1. An electric switch for controlling electrical energy such as for instance in electric motor driven tools comprising, a housing, a plurality of stationary electrical contacts mounted in said housing, an insulative contact carrier mounted in said housing and being movable relative thereto, movable electric

contact means mounted on said carrier for coaction with said stationary contacts, said carrier being reciprocable generally linearly relative to said housing for moving said movable contact means relative to said stationary contacts and thus causing actuation of said switch from "off" to "on" position and vice versa, a rocker actuator pivotally mounted on said housing and coacting with said carrier for causing said movement of said carrier, said actuator being comprised of two pieces, one piece of which is pivoted to said housing and the other piece of which coacts with said one piece and coacts with said carrier for actuating the carrier in its said reciprocal movement responsive to pivotal movement of said actuator, said other piece being withdrawable from said one piece and when so withdrawn preventing actuation of said switch, said one piece including an opening therein through which said other piece extends in the assembled condition of said pieces of said actuator, said other piece having means thereon adapted for interfering coaction with means on said housing in one pivoted position of said actuator for preventing withdrawal of said other piece relative to said one piece of said actuator in said one pivoted position of said actuator while permitting withdrawal movement of said other piece relative to said one piece in another pivoted position of said actuator, said means on said other piece being movable therewith through said opening during assembly of said pieces and permitting said assembly of said pieces in only one entry position of said other piece relative to said one piece, said means on said other piece being adapted for interfering coaction with said opening in the event said other piece is rotated to a position different from said one entry position, thereby preventing said assembly of said pieces and wherein said means on said other piece comprises a laterally projecting lug and said means on said housing comprises a shoulder projecting laterally inwardly of said housing, said lug being adapted to be positioned in interfering relation with respect to said shoulder in said one pivoted position of said actuator for preventing withdrawal of said other piece with respect to said one piece, said lug being movable out of interfering relation with respect to said shoulder upon pivotal movement of said actuator to said other pivoted position and permitting withdrawal movement of said other piece from said one piece, said one piece of said actuator comprising a rocker type operating member having trunnion means on the sides thereof received in complementary openings in said housing and pivotally mounting said operating member to said housing, and said other piece of said actuator comprising a head portion projecting upwardly from said operating member and an arm portion extending through said opening and a finger portion extending downwardly from said arm portion and passing into engageable coaction with said carrier for actuating said carrier for its said reciprocal movement, and means on said operating member coacting with means on said arm portion for guiding insertion and withdrawal movement of said other piece relative to said one piece, said withdrawal of said one piece removing said finger portion from coaction with said carrier, thus detaching said actuator from said carrier whereby said one piece can be pivoted about said trunnion means relative to said carrier without resulting in said reciprocable movement of said carrier.

4,705,921

PATCH MODULE

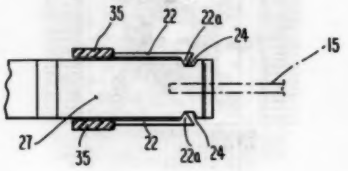
Alexander Rabey, Hatboro, and Herbert J. Hampel, Feasterville, both of Pa., assignors to VIR, Inc., Southampton, Pa.

Filed Aug. 26, 1986, Ser. No. 901,053

Int. Cl.[4] H01H *9/20*; H01R *33/96*

U.S. Cl. 200—50 B **22 Claims**

1. In a patch module, the module comprising first and second sets of receptacles, the first set having three receptacles and the second set having two receptacles, both of said sets of receptacles being mounted on a printed circuit board, the printed circuit board having electrical connections which join the conductors of the first receptacle of said first set with the conductors of the first receptacle of said second set, and which join the conductors of the second receptacle of said first set with the conductors of the second receptacle of said second set, the module including a panel which is movably mounted to and slidable along the printed circuit board, the panel having contact means for completing an electrical connection, on the printed circuit board, between the conductors of the first receptacle of said second set and the conductors of the second receptacle of said second set, the panel being connected to a spring means biasing the panel, such that the conductors of said first and second receptacles of said second set are normally electrically connected together, wherein the improvement comprises tab means, slidably mounted within both the first and second receptacles of said first set, the tab means being



slidable towards the panel in response to pressure from a plug inserted into the receptacle, wherein the panel is movable in a direction generally perpendicular to that of the tab means, and wherein the panel includes a cam surface which abuts the tab means, wherein movement of the tab means, towards the cam surface of the panel, causes the panel to move in a direction generally perpendicular to that of the tab means, the angle of the cam surface being such that the distance traveled by the panel is less than the distance traveled by the plug, whereby the panel slides along the board and breaks the electrical connection between said first and second receptacles of said second set upon insertion of a plug into either one of the receptacles of said first set.

4,705,922

RELAY FOR THE OPERATION OF A BELT TIGHTENER OR TENSIONER FOR AUTOMOBILE SAFETY BELTS

Gunter A. Seeger, Frittlingen, and Arno Reger, Deilingen, both of Fed. Rep. of Germany, assignors to Hengstler Bauelemente GmbH, Fed. Rep. of Germany

Filed Nov. 24, 1986, Ser. No. 933,826

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1986, 3619474

Int. Cl.[4] H01H *35/14*

U.S. Cl. 200—61.45 M **24 Claims**

1. A relay for the operation of a belt tightener or tensioner for automobile safety belts in the event of a collision with an obstacle, the relay comprising:

a housing having walls definingg a cavity therein;

a conduit or dry-reed contact arrangement mounted in the cavity defined by the housing, the conduit or dry-reed contact arrangement having a longitudinal axis which is perpendicular to the direction of travel of the automobile;

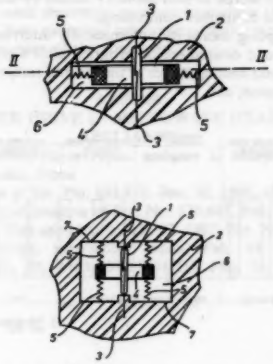
the conduit or dry-reed contact arrangement longitudinal axis is vertical to the horizontal plane of the automobile;

a magnet system mounted in the housing for initiating a switching sequence which operates the belt tightener or tensioner;

the magnet system including a permanent magnet which is primarily horizontally movable, the permanent magnet surrounding the conduit or dry-reed contact arrangement;

the permanent magnet is perpendicular to the conduit or dry-reed contact arrangement longitudinal axis; and

spring means affixed to said permanent magnet and supported within said cavity for positioning said permanent



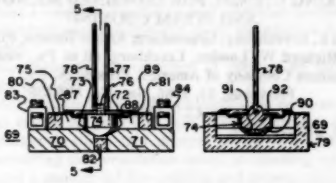
magnet equidistant from the conduit or dry-reed contact arrangement when the permanent magnet is at rest.

4,705,923

LOW VOLTAGE VACUUM CIRCUIT INTERRUPTER

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Division of Ser. No. 770,931, Aug. 30, 1985, Pat. No. 4,667,071.
This application Mar. 2, 1987, Ser. No. 21,365
Int. Cl.[4] H01H *33/66*
U.S. Cl. 200—144 B **8 Claims**



1. A vacuum circuit interrupter comprising:

a pair of first and second shaped metal conductors arranged side by side, said first metal conductor having a first contact surface formed on one side and opposedly spaced from a second contact surface formed on one side of said second metal conductor, said first and second metal conductors also having means for connection with an external electric circuit;

a dielectric spacer having parallel opposing front and back walls interconnecting parallel opposing first and second side walls, and an apertured bottom extension coextensive with said first and second formed contact surfaces for providing predetermined dielectric spacing between said first and second metal conductors;

a bridging contact supported by a flexible diaphragm and arranged for electrical connection between said first and second formed contact surfaces when said flexible diaphragm is in a first position and for interrupting electrical conpection between said first and second formed contact surfaces when said flexible diaphragm is in a second position;

said pair of first and second shaped metal conductors being sealed to one side of said dielectric spacer and said flexible diaphragm being sealed to an opposite side of said dielectric spacer to define an enclosed space between said first and second formed contact surfaces.

4,705,924

WALL SWITCH EXTENSION OPERATOR

Varoujan H. Hevoyan, 6318 W. 77th St., Los Angeles, Calif. 90045

Filed Jun. 12, 1986, Ser. No. 873,347
Int. Cl.[4] H01H *3/04*
U.S. Cl. 200—331 **4 Claims**

1. A wall switch extension operator for a wall switch installation permanently covered by a switch plate through which a pivotal toggle projects for manipulation into alternate angular "ON" and "OFF" positions, there being upper and lower fasteners and either of which permanently secures the switch plate to a wall to cover a switch and its electrical wiring, and including;

a guide means attached to an exterior of the switch plate by one of said fasteners removed from the switch plate and replaced through the guide means and the switch plate securing one to another,

and operating means comprised of a flexible member of resilient material and slideably engaged through the guide means in alignment with movement of the toggle and with a portion projecting freely from the guide means and having an aperture engaged over the toggle to push and pull the toggle into said alternate angular "ON" and "OFF" positions and removable from the toggle by manually deflecting it therefrom ,

the operating means being extended from the guide means and switch plate for manipulation remote therefrom.

4,705,925

KEY MODULE WITH KEY MEMBER RETAINED BY SWING MEMBERS

Ronny Vermeulen, Bellegem, Belgium, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 29, 1986, Ser. No. 867,964
Claims priority, application Fed. Rep. of Germany, May 30, 1985, 3519422
Int. Cl.[4] H01H *13/02, 13/14*
U.S. Cl. 200—340 **6 Claims**

1. A key module, comprising:

a dome-shaped key member formed of elastic material having a closed end and an open end limited by an edge;

a substantially hollow-cylindrical plastic housing part formed to accept said key member within one end thereof when said key member has its closed end inserted therein

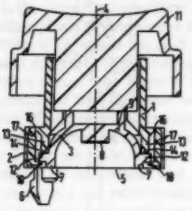
and wherein a longitudinal axis of said key member is coaxial with a longitudinal axis of said housing part;

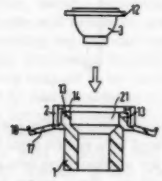
an outwardly directed shoulder on said key member in a proximity of the edge at the open end thereof;

said shoulder comprising a web which surrounds said key member in a proximity of said edge;

said plastic housing part having an inside wall terminating in a seating surface which abuts against said web when the key member is seated within the housing part;

said plastic housing part having swing members freely movable back and forth between a locking and unlocked position, each being of integral one-piece construction with said housing part and which are attached to the housing part by integral film hinges;





said swing members being positioned and attached such that they swing in a plane parallel to the longitudinal axis of the housing part and havng retaining hooks which in the locking position have an engagement surface parallel to said seating surface of said inside wall and spaced from said seating surface by a thickness of said web of said key member, the retaining hooks engaging said web when said key member is inserted in the housing part; and

said retaining hooks of said swing members each having projection means for engagement with edges of said plastic housing part so as to retain said retaining hooks in said locking position.

4,705,926

ELECTRONIC CONTROL COOKING APPARATUS

Haruo Sakai, and Kiyoshi Hiejima, both of Ohtsu, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Dec. 2, 1985, Ser. No. 803,411

Claims priority, application Japan, Dec. 3, 1984, 59-255492

Int. Cl.[4] H05B 6/68

U.S. Cl. 219—10.55 B **17 Claims**

1. An electronic control cooking apparatus comprising:

(a) a heating chamber for receiving food to be heated;

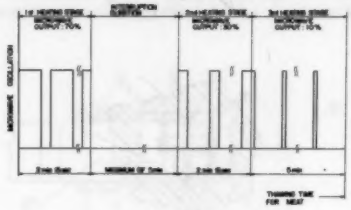
(b) an operation unit for setting recipe data for a recipe program or for selecting a recipe program from a number of pre-set recipe programs;

(c) memory means for storing desired recipe program, said desired recipe program including a plurality of heating stages and a predetermined maximum interruption duration occurring between said plurality of heating stages, said desired recipe program being input into said memory means by said operation unit;

(d) heating energy supply means for supplying to said heating chamber heating energy for heating food to be heated; and

(e) a controller for controlling the driving of said heating energy supply means in accordance with a desired recipe program stored in said memory means by said operation unit, said controller comprising,

(i) interrupting means for automatically interrupting execution of said desired recipe program after a completion of one of said heating stages of the desired recipe program to be executed, and



(ii) first execution means which restarts the execution of the desired recipe program from the next stage of said predetermined heating stage, when said operation unit is actuated to restart the heating during the predetermined maximum interruption duration,

(iii) second execution means for restarting at the end of the maximum interruption duration the execution of the desired recipe program from the next stage of said predetermined heating stage, when said operation unit is not actuated to restart the heating during the predetermined maximum interruption duration.

4,705,927

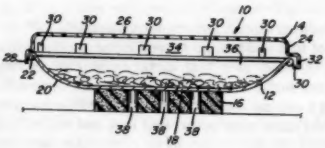
COOKING UTENSIL FOR COMBINED MICROWAVE AND STEAM COOKING

Thomas L. Levendusky, Greensburg; Arthur Benson, Pittsburgh, and Richard W. Lunden, Leechburg, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 14, 1986, Ser. No. 896,438

Int. Cl.[4] H05B 6/80

U.S. Cl. 219—10.55 E **9 Claims**



1. In a microwave opaque cooking utensil for use in microwave cooking of foodstuffs wherein a container includes a bottom portion which is engageable with a supporting surface and side portions projecting radially outwardly and upwardly of said bottom portion to form an upwardly open concave foodstuff receiving space which permits exposure of foodstuff contained therein to microwave radiation from a source located generally above the container, the improvement comprising:

a microwave transparent, water absorbing member, the entire body of which underlies said bottom portion and supports said container,

said microwave transparent, water absorbing member being of a configuration with respect to said container and of a sufficient section thickness, that said member is exposed to microwave radiation from such a source whereby, when

moistened with water and exposed to such microwave radiation, said water absorbing member evolves steam which passes therefrom over the side portions of the container for indirect steam heating of a foodstuff contained in the container, and steam chamber means formed in said water absorbing member to contain the evolved steam in heat exchange relationship with respect to said bottom portion of the container.

4,705,928

DAMPER DRIVE IN MICROWAVE HEATING APPLIANCE

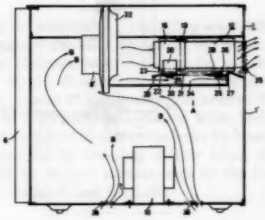
Takao Nakanishi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 823,971, Jan. 30, 1986, abandoned, which is a continuation of Ser. No. 578,643, Feb. 9, 1984, abandoned. This application Feb. 17, 1987, Ser. No. 16,479

Claims priority, application Japan, Feb. 16, 1983, 58-21773[U]; Feb. 16, 1983, 58-21774[U]; Feb. 16, 1983, 58-21775[U]

Int. Cl.[4] H05B *6/64*

U.S. Cl. 219—10.55 B **3 Claims**



1. A heating appliance which utilizes a coiled shape memory alloy spring to regulate a damper which controls ventilation air which enters a heating chamber of said appliance comprising:

a hot-air circulating microwave oven including a heating chamber,

ventilation holes for introduction of cooling air into said heating chamber,

a damper for controlling said cool ventilation air to be introduced via an air path into said heating chamber during microwave heating, said damper comprising a damper unit covering said ventilation holes, an opening into said unit and a damper lid for opening and closing said opening,

a duct system inclusive of said air path housing said damper, and

a coiled shape memory alloy damper spring which selectively opens and closes said damper lid during operation of said hot-air circulating microwave oven, said coiled shape memory alloy damper spring being juxtapositioned outside said damper unit within said duct system in the path of said cool ventilation air so as to be cooled to reduce its sensitivity to increases in temperature by virtue of consequential increases in temperature of said heating appliance and be held at a relatively low temperature condition thereby avoiding a residual thermal effect to said shape memory alloy spring.

4,705,929

MICROWAVE TRAYS

William G. Atkinson, London, Canada, assignor to Somerville Belkin Industries Inc., London, Canada

Filed Dec. 18, 1986, Ser. No. 942,994

Int. Cl.[4] H05B *6/80*

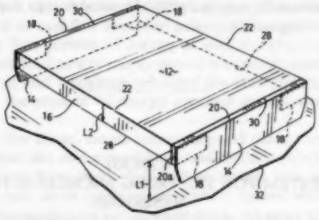
U.S. Cl. 219—10.55 E **4 Claims**

1. A heating stand for supporting an item which is to be heated in a microwave oven comprising;

(a) a boxboard blank having an upper face, a lower face, a pair of longitudinally spaced first edges and a pair of transversely spaced second edges,

(b) a microwave intereactive layer of material on said upper face of said blank, said interactive layer extending continuously between said first edges, said interactive layer being spaced laterally inwardly from said second edges to form uncoated margins at each of said second edges of said blank,

(c) said blank being creased to provide fold lines which define a platform panel, support leg panels and leg bracing panels, said platform panel being proportioned to provide support for an article to be heated, said support leg panels being foldable along their crease line to project downwardly from said platform to support said platform in an



elevated position in a microwave oven, said leg bracing panels being foldable along their crease line to project downwardly from said platform and being connectable to the support leg panels to rigidifying the support leg panels,

(d) said support legs and said bracing panels each having a distal end remote from said support panel, the distal ends of said support legs being formed from said uncoated margins of said blank so as to be inactive when subjected to microwave radiation, said distal ends of said support legs projecting a substantial distance below the distal ends of said leg bracing panels when in the folded position to support the interactive platform and the interactive leg bracing panels in a spaced relationship with respect to the underlying support surface.

4,705,930

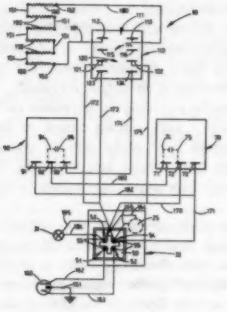
HEATING CONTROL APPARATUS

Curtis J. Sathre, Jr., and Mark R. Thornton, both of Fresno, Calif., assignors to Duncan Enterprises, Fresno, Calif.

Filed Jul. 31, 1986, Ser. No. 890,927

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—492 **10 Claims**



1. A heating control apparatus for a heating element mounted internally of a kiln, the apparatus comprising a power

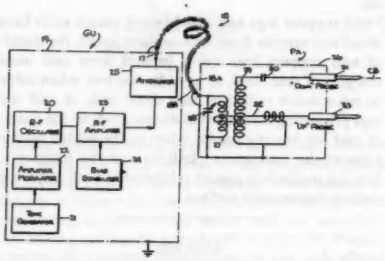
relay borne by the kiln, the power relay mounting a normally closed switch operable to supply electrical energy to the heating element in a first operating condition and to terminate the supply of electrical energy to the heating element in a second operating condition in response to receiving an electrical pulse; an interval timer borne by the kiln and operatively connected to said normally closed switch for periodically supplying said electrical pulse to the normally closed switch; and a fixed timer interposed between the interval timer and the normally closed switch operable to maintain communication between the interval timer and the normally closed switch for one period of operation and to prevent communication between the interval timer and the normally closed switch during another period of operation whereby the heating element is intermittently supplied with electrical energy during one phase of operation and is continuously supplied with electrical energy during another phase of operation.

4,705,931

SYSTEM FOR TRIMMING MICROELECTRONIC RESISTORS

Alfonso Di Mino, Woodcliff Lake, N.J., assignor to ADM Tronics Unlimited, Inc., Northvale, N.J.

Filed Sep. 19, 1986, Ser. No. 909,475
Int. Cl.[4] H05B *6/00*; H01L *21/326, 21/479*
U.S. Cl. 219—68 **7 Claims**



1. A system for electronically trimming the ohmic value of a printed circuit resistor without changing its physical dimensions, said system comprising:

A a self-contained generating unit producing a low radio-frequency carrier having a predetermined frequency which is overmodulated by a sonic frequency to cause the carrier to be periodically interrupted to produce periodic bursts of radio-frequency energy at a repetition rate determined by the sonic frequency, whereby bursts of such energy are yielded at an output terminal;

B a portable probe assembly independent of the generating unit including a tank circuit tuned to the carrier frequency, a tipped "Up" probe directly coupled by step-up means to the tank circuit and a tipped "Down" probe directly coupled by step-down means to the tank circuit; and

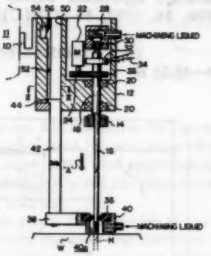
C an extension cable connecting the output terminal of the generating unit to the tank circuit of the probe assembly whereby a corona discharge beam is projected from the tip of the "Down" probe, which beam when directed at the resistor acts to decrease its ohmic value, and a relatively low voltage having a high current density is established at the tip of the "Up" probe when it makes contact with the resistor to effect an increase in its ohmic value.

4,705,932

ELECTRICAL DISCHARGE BORING MACHINE

Toshiyuki Aso, and Tamotu Tshibashi, both of Hino, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP85/00063, § 371 Date Oct. 11, 1985, § 102(e) Date Oct. 11, 1985, PCT Pub. No. WO85/03657, PCT Pub. Date Aug. 29, 1985
PCT Filed Feb. 15, 1985, Ser. No. 795,699
Claims priority, application Japan, Feb. 15, 1984, 59-25202
Int. Cl.[4] B23H *1/00, 1/10, 7/30*
U.S. Cl. 219—69 V **2 Claims**



1. An electrical discharge boring apparatus for attachment to a wire electrode discharge type electrical discharge machine having a vertical feed mechanism, said boring apparatus comprising:

a main unit including means for joining said unit to a vertical feed mechanism of a wire electrode discharge type electrical discharge machine to be moved as a unit therewith vertically relative to an electrically conductive workpiece;

a rotary chuck, driven by a rotary driving motor, provided at a lower part of said main unit for holding a hollow bar electrode, said main unit and hollow bar electrode being moved downwardly by said vertical feed mechanism in performance of an electrical discharge boring operation;

a rotary joint provided within said main unit to introduce machining liquid into said hollow bar electrode held by said rotary chuck;

a guide rail slidably fitted to a slide hole formed in said main unit for vertical movement with respect to said main unit;

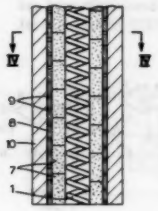
a guide holder, fixed to a lower end of said guide rail near said workpiece, including a slide guide for slidably guiding said hollow bar electrode near said workpiece, said guide holder being capable of resting against said workpiece during an electrical discharge boring operation so as to move said guide rail upwardly with respect to said main unit as said main unit and hollow bar electrode move downwardly toward said workpiece; and

said guide holder being formed with a recessed area at a lower surface thereof below said slide guide to provide an internal space about said hollow bar electrode adjacent said workpiece, said guide holder being formed with nozzle means at a lower part thereof for connection to a source of machining liquid to supply machining liquid to said internal space.

4,705,933
METHOD FOR ATTACHING A DIAMOND COMPONENT TO METAL

Peter K. van Bennekom, Bergen, and Michael Seal, Amsterdam, both of Netherlands, assignors to D. Drukker & Z.N. N.V., Amsterdam, Netherlands

Filed Mar. 22, 1985, Ser. No. 715,012
Claims priority, application Netherlands, Mar. 23, 1984, 8400939
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121 LC **8 Claims**

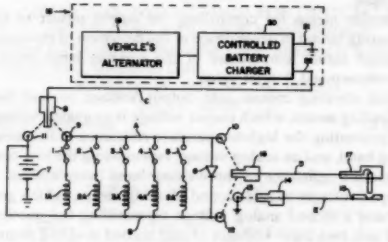


1. A method for assembling a travelling wave tube having a metal helix disposed therein, comprising the steps of:
(a) providing diamond support blocks for mounting to said helix in a regular distribution along its circumference;
(b) providing a layer of first brazing material at the interface between the support blocks and the helix; and
(c) brazing the support blocks to the helix by heating the first brazing material by focusing a laser beam through the support blocks at least substantially on the interface between the diamond and the helix.

4,705,934
ARC WELDER

Harry L. Winkler, P.O. Box 632, Pinehurst, Id. 83850

Filed Mar. 18, 1985, Ser. No. 713,288
Int. Cl.⁴ B23K *9/10*
U.S. Cl. 219—137 PS **5 Claims**

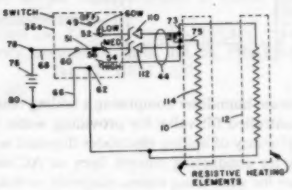


1. An arc welding system comprising:
five single conductor taper lock jacks, means connecting first and a second jack to a first lead, means connecting a third and a fourth jack to a second lead, means connecting a fifth jack to ground, a first jack plug, means connecting said jack plug to a third lead;
two welding cables, one welding cable having a workpiece clamp connected at one end and having a second jack plug at the other end, said second jack plug being plugged so into said fifth jack, the other welding cable having an electrode holder connected to one end and a third jack plug at the other end, said third jack plug being plugged into a selected one of two jacks, a jack on the first lead and or a jack on the second lead;
a supplemental power supply comprising a thirty-six volt battery system, installation means connecting said battery system to an automobile type vehicle, means connecting a negative terminal of said battery system to ground, means connecting a positive terminal of said battery system to said second lead;
a principal power source comprising an alternator of said vehicle and a battery charger of said vehicle, said alternator is connected to said battery charger, means connecting a negative output power terminal of said battery charger to ground, means connecting a positive output power terminal of said battery charger to said third lead, said first jack plug being plugged into a selected one of two jacks, a jack on the first lead or a jack on the second lead;
means electrically connecting said principal power source and said supplemental power supply at workload in welding, said first jack plug being connected into said first jack on said first lead, said second jack plug being plugged into said fifth jack, said third jack plug being plugged into said second jack on said first lead, said principal power source provides a first portion of energy at said workload and said supplemental power supply provides a second portion of energy at said workload; whereby the jack selections determine the amount of energy supplied at said workload;
a silicon rectifier diode, means connecting said diode across said first lead and said second lead, said diode is poled to block current flow from said battery system into said workload, said diode provides said battery system with a charging means during time when an arc is not generated.

4,705,935
HEATED SOCKS

Albert J. Traffanstedt, Rte. 8, Box 221, Boaz, Ala. 35957, and Roy Traffanstedt, 615 Half Section Line Rd., Apt. 107, Albertville, Ala. 35950

Filed Aug. 20, 1985, Ser. No. 767,494
Int. Cl.⁴ H05B *1/02*
U.S. Cl. 219—211 **3 Claims**



1. A pair of heatable socks comprising:
a resistive heating unit secured within each sock of said pair of socks and having a given floating ground terminal;
a portable battery source having first and second terminals with said first terminal being a floating ground terminal;
a switching means having first and second terminals connected across said first and second terminals of said portable battery source, respectively, a plurality of output contacts, and an arm for connecting any selected output contact to said second battery terminal;
circuit means for connecting said given floating ground terminal of each of said resistive heating units to said first terminal of said switching means and for connecting different ones of said output contacts to said resistive heating units to produce equal but selectively different current values through each of said resistive heating units;
each of said resistive units comprising a resistor having a given resistive value and having first and second end terminals; and
in which said switching means comprises N output contacts, and further comprising:
a Zener diode connected between each of N−1 of said plurality of switching means output contacts and the second terminal of said resistor, and with the remaining

switching means output contact being connected directly to said second end terminal of said resistors;

each of said Zener diodes being selected to have a breakdown voltage different from that of any other selected Zener diode; and

in which said switching means is controllable to connect the second terminal of said battery source to any selected one of said switching means contacts to control the amount of current flowing through said resistors.

4,705,936

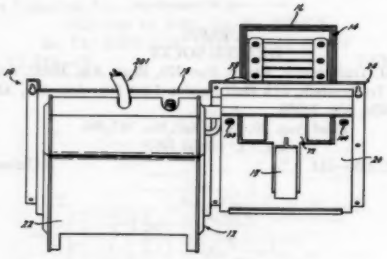
ELECTRONICALLY CONTROLLED ELECTRIC STEAM HUMIDIFIER

James M. Fowler, Houston, Tex., assignor to Masco Corporation, Taylor, Mich.

Filed Jan. 17, 1985, Ser. No. 692,389

Int. Cl.[4] H05B *1/02, 3/60*; F22B *1/30*

U.S. Cl. 219—295 **13 Claims**



1. A steam humidifier comprising a boiling tank, an electronically controlled fill valve for providing water to the boiling tank, a plurality of boiling electrodes disposed within the boiling tank for conducting current from an AC source through the water for generating steam, electrode switching means for selectively connecting an AC source to said boiling electrodes, a current detector for sensing the magnitude of current flowing to the boiling electrodes, an electronic valve control circuit connected to the current detector and the fill valve for actuating the fill valve to automatically replenish water boiled from the boiling tank in response to a decrease in the magnitude of current sensed by the current detector, means for producing a steam operation control signal while the humidifier is operating in a steam generation mode, first timer means coupled to said control signal producing means for accumulating an indication of the total time that said control signal is produced and for generating a first timer output signal indicative of a predetermined accumulated time of operation of the humidifier in a steam generation mode; said electrode switching means coupled to said first timer means and responsive to said first timer output signal for preventing the flow of current to said boiling electrodes, second timer control means coupled between said first timer means and said fill valve, said second timer control means responsive to said first timer output signal for actuating said fill valve for a predetermined flush time period corresponding to the time required to flush the boiling tank; and means in communication with said boiling tank and operative during the flush period for draining from said boiling tank water added thereto by said fill valve during said flush period.

4,705,937

APPARATUS FOR AUTOMATICALLY CONTROLLING THE TEMPERATURE OF WELDING BANDS

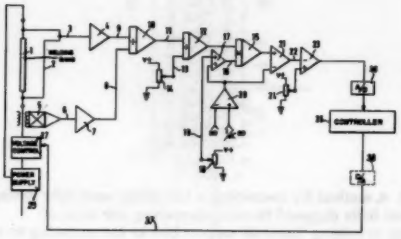
Rainer Marek, Rheine, Fed. Rep. of Germany, assignor to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed May 8, 1986, Ser. No. 860,815

Claims priority, application Fed. Rep. of Germany, May 8, 1985, 3516601

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—497 **5 Claims**



1. Apparatus for automatically controlling the temperature of welding bands used to weld plastic films or the like, comprising

a heating circuit for causing said welding band to heat up;

first dividing means, an analog voltage representing the voltage applied to the welding band, and an analog voltage representing the current flowing through the heating circuit being applied as input voltages to said first dividing means which generates an output voltage representing the quotient of said two input voltages of said first dividing means;

controller means for controlling the output power of the heating circuit in dependence of the deviation of the determined actual temperature of the welding band from a predetermned desired value;

second dividing means, said output voltage of said first dividing means, which output voltage is an analog voltage representing the high-temperature resistance of the welding band, and an analog voltage representing the low-temperature resistance of the welding band being applied as input voltages to said second dividing means, which generates a second analog voltage representing the quotient of said two input voltages of said second dividing means;

multiplying means, said second analog voltage being multiplied in said multiplying means with the output voltage generated by an analog adder as the sum of an analog voltage representing the low temperature at which the low-temperature resistance of the welding band has been measured and an auxiliary analog voltage, which represents a calculated auxiliary temperature;

first subtracting means for subtracting the auxiliary voltage from the output voltage of said multiplying means and for generating an analog voltage which represents the actual temperature of the hot welding band; and

second subtracting means, which generates a differential voltage representing the difference between the analog voltage reprcsenting the determined actual temperature of the welding band and the analog voltage representing the predetermined desired temperature of the welding band.

4,705,938

METHOD OF SECURING DATA ON A DATA SUPPORT

Hermann Stockburger, Kirnachweg 7, D-7742 St. Georgen, and Hans-Georg Winderlich, Niedere Str. 36, D-7730 Villingen, both of Fed. Rep. of Germany

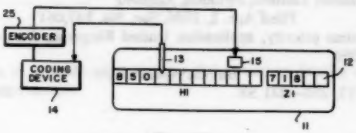
Continuation of Ser. No. 509,330, Jun. 30, 1983, Pat. No. 4,469,937, which is a continuation of Ser. No. 261,196, May 8, 1981, abandoned. This application Jun. 18, 1984, Ser. No. 621,808

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1979, 2936409

The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.

Int. Cl.⁴ G06K *7/12*

U.S. Cl. 235—435 **5 Claims**



1. A method of preventing the generation of a duplicate data support having characters which are the same in significance and physical properties as the characters of a data support comprising the steps of (a) recording a plurality of data information characters of a predetermined significance on said data support with at least some of said data information characters additionally having different physical properties, (b) measuring a physical property of selected ones of said data information characters having different physical properties and (c) recording checking characters representative of the measured physical property of at least some of said selected ones of said data information characters on said data support whereby duplicating the significance of the data characters of said data support would not result in the generation of a duplicate data support having identical characters both in significance and physical properties of the characters of the data support being duplicated.

4,705,939

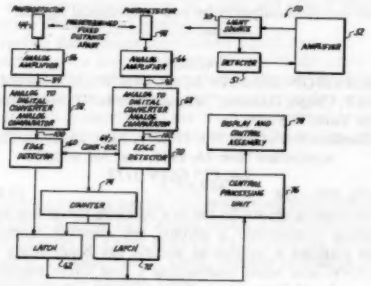
APPARATUS AND METHOD FOR OPTICALLY MEASURING BAR CODE DIMENSIONS

Richard J. Ulinski, Sr., Monrovia, Calif., assignor to RJS Enterprises, Inc., Monrovia, Calif.

Filed Sep. 28, 1984, Ser. No. 655,535

Int. Cl.⁴ G06K *7/10*

U.S. Cl. 235—466 **12 Claims**



1. In a bar code measuring apparatus for measuring absolute distance of bars and spaces having a photodetector receiving reflected light from a first point as the photodetector is passed over bars and spaces, for sensing bars and spaces and for producing first digital signals directly proportional to the absolute time of passing over each bar and each space, having digital signal storage memory means for storing in sequential order digital signals proportional to the absolute time of passing over each bar and space detected by the sensing, and having digital processing means for manipulating said stored signals to determine the time of passing over each bar and each space against some reference measurement, the improvement comprising:

a second photodetector means integral with and fixed a predetermined distance from said first photodetector means, having a photodetector receiving reflected light from a second point a predetermined distance from the first point at which said first photodetecting means receives reflected light, and connected to said digital signal storage memory means, for producing and directing into said digital signal storage memory means second digital signals directly proportional to the absolute time of passing over each bar and each space, said second photodetector means having further digital processing means for comparing said first digital signals with said second digital signals and for producing an absolute measurement of the distance of each bar and space.

4,705,940

FOCUS DETECTION IN A PROJECTION OPTICAL SYSTEM

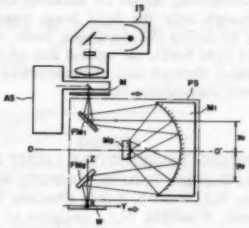
Michio Kohno, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1985, Ser. No. 757,341

Claims priority, application Japan, Jul. 26, 1984, 59-157884

Int. Cl.⁴ G01J *1/20*

U.S. Cl. 250—201 **7 Claims**



1. A projection apparatus usable with a first object having a pattern and a second object, said apparatus comprising:

a projection optical system having an imaging plane which includes a first portion wherein aberrations have been corrected in a predetermined manner and a second portion different from said first portion;

means for transferring the pattern of the first object onto the second object by use of said first portion of said imaging plane of said projection optical system; and

means for photoelectrically detecting the second object by use of said second portion of said imaging plane of said projection optical system, to detect a positional relation between the second object and said imaging plane of said projection optical system.

4,705,941

APPARATUS FOR DETECTING A FOCUSING STATE OF AN OPTICAL SYSTEM

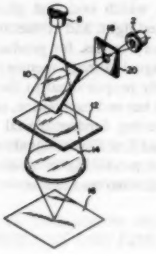
Hisashi Yamada, Yokohama, and Seiichi Ohgoshi, Hiratsuka, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 28, 1984, Ser. No. 625,609

Claims priority, application Japan, Jun. 30, 1983, 58-119345; Dec. 5, 1983, 58-228337

Int. Cl.[4] G01J 1/36

U.S. Cl. 250—201 11 Claims



1. An apparatus for detecting a focusing state of an optical system, comprising:

means for generating a light beam;

a convergent lens, movable along its optical axis, for converging the light beam, projecting the converged light beam toward a target surface and converging the light beam reflected from the target surface;

photodetecting means located at a position deviated from a point on which the reflected converged light beam is converged when said convergent lens is in the focusing state, including first and second photosensitive regions for detecting the beam size of the light beam and converting the light beam into first and second photo signals indicative of the beam size of the reflected light beam hitting the respective first and second photosensitive regions; and

means provided in the path of the reflected light beam directed from the convergent lens toward the detecting means, including a light beam blocking region and a light beam transmitting region for allowing the light beam to pass through only the light beam transmitting region thereby to define the maximum beam diameter of the reflected light beam, the optical axis of said convergent lens passing through said photodetecting means and the light beam transmitting region.

4,705,942

PRESSURE-SENSITIVE LIGHT PEN

Zigmantas L. Budrikis, Dalkeith, Australia; Mehdi Hatamian, Old Bridge, N.J.; Peter S. Kubik, Chatham, Mass., and Arun N. Netravali, Westfield, N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 26, 1985, Ser. No. 813,586

Int. Cl.[4] G06K 7/10

U.S. Cl. 250—227 5 Claims

5. A light pen system comprising:

a light pen for developing an output signal in response to light accepted by said pen, said pen including a collimation rod slidably mounted within said pen and projecting outwardly from an opening of said pen, with said rod adapted to slide into said pen in response to applied pressure, resiliently slide out of said pen in response to removal of said pressure, and disperse the light flowing through the end of said rod within said pen, said pen further including a photodetector for detecting light dispersed by said rod and developing an output signal proportional to the intensity of the detected light, said intensity being proportional to applied pressure; and

means responsive to said output signal for computing the centroid of said output signal.

4,705,943

ROTATIONAL OPTICAL ENCODER HAVING BINARY OUTPUT

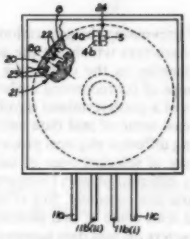
Trevor G. Charlton, Swindon, England, assignor to Spectrol Reliance Limited, Swindon, England

Filed Apr. 1, 1986, Ser. No. 847,061

Claims priority, application United Kingdom, Apr. 4, 1985, 8508950

Int. Cl.[4] G01D 5/34

U.S. Cl. 250—231 SE 20 Claims



1. A rotational binary output encoder comprising a housing defining an enclosed space, a rotatable shaft extending through the housing into said space, light transmitting and light receiving means mounted in said housing, a transparent planar member mounted in said housing and having grid means mounted on one surface thereof in the path of travel of light between said light transmitting and light receiving means, reflector means mounted on the other surface of said transparent planar member in opposed, spaced relation to said light transmitting and light receiving means either said light transmitting and light receiving means or said transparent planar member with said grid means being rotatable with said shaft so that the grid means intermittently interrupts the light passing from the light transmitting means to the light receiving means to produce opto-digital signals, and electric circuit means for providing a digital electrical output from said opto-digital signals.

4,705,944

FORMATION DENSITY LOGGING WHILE DRILLING

Daniel F. Coope, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

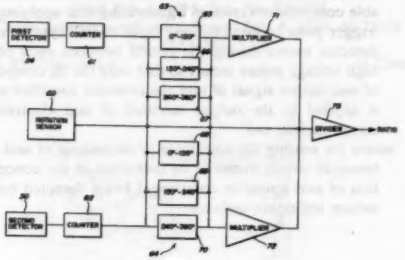
Continuation of Ser. No. 478,979, Mar. 25, 1983. This application Nov. 14, 1986, Ser. No. 930,999

Int. Cl.[4] G01V 5/12

U.S. Cl. 250—254 15 Claims

1. A rotating device for use in a borehole traversing an earth formation comprising: a gamma ray emitting means, said means emitting a collimated gamma ray beam along a first trajectory, said beam intersecting a first circle located in a sample of said formation to be measured; a first gamma ray detecting means oriented to receive emitted gamma rays scattered from locations within said first circle; a means for counting said received gamma rays during I preselected periods of time, each period being equal and commencing each 360°/I of rotation, and wherein I is an integer which is at least three; and

a means for determining a first product of the counts of gamma rays received by said first detecting means during said I time



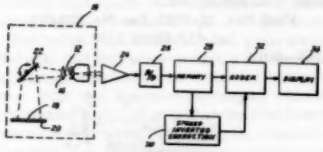
periods to provide an indication of the average density of said formation sample.

4,705,945

NARCISSUS CORRECTION FOR INFRARED SCANNING MICROSCOPE

Peter C. Worcester, Fairfield, Conn., assignor to Barnes Engineering Company, Shelton, Conn.

Filed Jan. 31, 1986, Ser. No. 824,488
Int. Cl.[4] G01J 5/06
U.S. Cl. 250—334 **1 Claim**



1. A method of correcting for the "Narcissus Effect" of an infrared scanning microscope employing a cooled infrared detector comprising the steps of:

scanning a target at a first uniform temperature so as to provide a first temperature radiance signal from said infrared detector,

scanning a target at a second uniform temperature so as to provide a second temperature radiance signal from said infrared detector,

selecting said first or second temperature to correspond to the ambient temperature in which said scan is made,

storing said first and second signals,

inverting the ambient temperature signal, and

combining the inverted signal along with the other stored signal with subsequent radiance signals derived from subsequent scans of the target so as to provide a correction for both emissivity and the "Narcissus Effect" to give the true temperature of each element of the target scan.

4,705,946

INFRARED SENSOR COMPRISING IMPROVED FEEDBACK LIMITED AMPLIFIER AND ASSOCIATED METHOD FOR AMPLIFYING ELECTRONIC SIGNALS

Donald R. Cargille, Venice, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

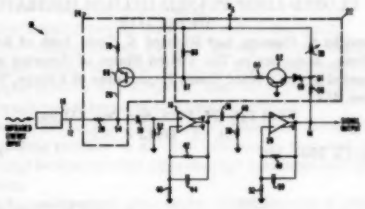
Filed Sep. 5, 1985, Ser. No. 772,786
Int. Cl.[4] G01J 5/32
U.S. Cl. 250—338 **15 Claims**

1. An improved infrared sensor of the type which scans across a spatial region and detects infrared enegy radiating from a celestial body and in which an input electronic signal is produced in response to the detected infrared energy, wherein the improvement comprises:

amplifier circuit means for providing an amplified output electronic signal is response to the input electronic signal; and

a feedback loop containing only substantially nonreactive components, the feedback loop comprising;

threshold detection circuit means for detecting when the output electronic signal reaches a prescribed threshold level substantially below a saturation level of said amplifier circuit means, said threshold detection circuit means comprising a thresholding circuit for providing a turn-on



signal when the output signal reaches the prescribed threshold level; and

feedback circuit means for providing a feedback signal for limiting the input electronic signal provided to said electronic amplifier circuit means said, feedback circuit means comprising a feedback amplifier circuit responsive to the turn-on signal, such that the feedback signal is provided when the output signal substantially reaches the prescribed threshold level;

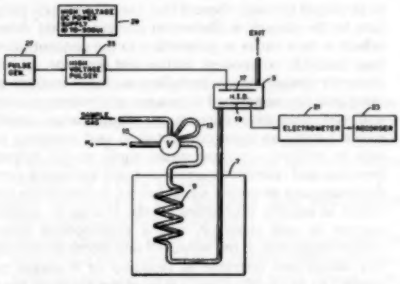
wherein the feedback loop is characterized by a feedback ratio selected to substantially dampen unwanted oscillations in said feedback loop.

4,705,947

PULSED HELIUM IONIZATION DETECTION SYSTEM

Roswitha S. Ramsey, and Richard A. Todd, both of Knoxville, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 9, 1985, Ser. No. 721,339
Int. Cl.[4] G01N 27/66
U.S. Cl. 250—386 **4 Claims**



1. A pulsed helium ionization detection system, comprising:

an ionization detection chamber including anode and cathode electrodes between which helium carrier gas containing an ionizable component to be detected is introduced and an ionizing radiation source disposed within said chamber for ionizing only said component to be detected;

ionization current sensing means for sensing and recording the magnitude of ionization current produced by the ionization of said component to be detected in said detection chamber as a direct indication of the concentration of said ionizable component introduced into said chamber; and

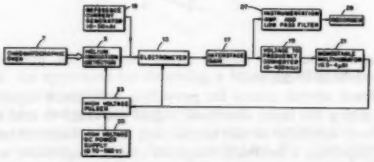
a high voltage pulser means for generating and applying bias voltage pulses at selected frequencies over a range of from about 1 kHz to 333 kHz, amplitudes up to about 500 volts and duty cycles to produce a discontinuous ionization current output sensed by said ionization current sensing means.

4,705,948

CLOSED-LOOP PULSED HELIUM IONIZATION DETECTOR

Roswitha S. Ramsey, and Richard A. Todd, both of Knoxville, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 24, 1986, Ser. No. 831,942
Int. Cl.[4] H01J *47/02*
U.S. Cl. 250—386 **6 Claims**



1. In combination, a helium ionization detector and a closed-loop control system for pulsed operation of the helium ionization detector, comprising:

a helium ionization detector having an anode and a cathode electrodes between which a helium carrier gas containing an ionizable component whose concentration is to be detected is introduced to be ionized to produce an ionization current therein which flows through said electrodes when a high voltage bias is applied between said electrodes;

a high voltage pulser means for generating and applying selected amplitude high voltage bias pulses between said electrodes of said detector in response to input switching pulses applied to an input thereof;

a reference current generator means for generating a selected reference current corresponding to a desired average ionization current in said detector;

an electrometer circuit means for generating an output signal at an output terminal thereof that varies in inverse proportion to the change in ionization current in said detector which in turn varies in proportion to the concentration of said ionizable component within said detector, said electrometer circuit means including an input current summing junction connected to receive said reference current and said ionization current, an electrometer amplifier means having an input connected to said summing junction to receive a current signal equal to the difference between said reference current and said ionization current for generating an output signal having an amplitude which varies in inverse proportion to the change in ionization current in said detector, and a synchronous detector means connected to the output of said electrometer amplifier means and operable in response to a trigger pulse applied to an enabling input thereof for applying the output of said electrometer amplifier means to said output terminal of said electrometer circuit means for the period said trigger pulse is applied to said enabling input of said synchronous detector means;

a switching pulse generating means responsive to said output signal of said electrometer circuit means for generating and applying said switching pulses to said high voltage pulser means at a frequency and a selected duty cycle which maintains a constant average ionization current flowing in said detector which is substantially equal to said reference current as the concentration of said ionizable component varies and generating and applying said trigger pulse to said enabling input of said synchrounous detector means during the period between each of said high voltage pulser means so that only the dc component of said output signal of said electrometer amplifier means is applied to the output terminal of said electrometer circuit means; and

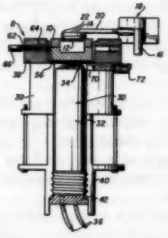
means for sensing the amplitude of the output of said electrometer circuit means as an indication of the concentration of said ionizable component being detected by said helium ionization detector.

4,705,949

METHOD AND APPARATUS RELATING TO SPECIMEN CELLS FOR SCANNING ELECTRON MICROSCOPES

John W. Grimes, II, Florence, Mont.; Hamlin Jennings, and Paul W. Brown, both of Damascus, Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Nov. 25, 1985, Ser. No. 802,091
Int. Cl.[4] G21K *5/08*
U.S. Cl. 250—440.1 **19 Claims**



1. An improved specimen cell for use in the evacuated chamber of a directed beam irradiation device having an electron beam, said cell comprising:

means for preventing dehydration and disruption of a specimen placed in the cell including closed specimen means for mounting and at least partially containing said specimen;

means for defining a single aperture between said specimen and said electron beam when said beam is directed towards said speciman, said aperture comprising a means, sized and gometrically configured, for bidirectionally passing electrons and for restricting passage of vapor from within to without said specimen means; and

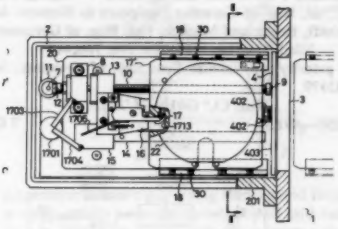
door means mounted on a pivotable arm for movement between an opened position and a closed position, for permitting bidirectional electron flow in said open position and for blocking said single aperture and for preventing passage of vapor from within to without said specimen means in said closed position, said door means comprising a backing metal plate attached to said arm and a facing of elastomeric material for blocking said aperture.

4,705,950

SPECIMEN-EXCHANGING APPARATUS

Tadashi Ohtaka, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 6, 1986, Ser. No. 826,662
Claims priority, application Japan, Feb. 6, 1985, 60-21321
Int. Cl.[4] G21K *5/08*
U.S. Cl. 250—441.1 **4 Claims**



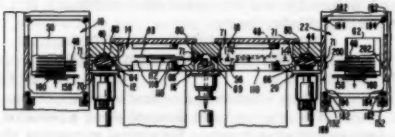
1. A specimen-exchanging apparatus comprising a specimen chamber subjected to a vacuum, a specimen-exchanging chamber connected with said specimen chamber, said specimen-exchanging chamber being openable to ambient air, valve means for sealing and releasing the connection between said specimen chamber and said specimen-exchanging chamber means for exhausting said specimen-exchanging chamber, rotating means for rotating a feed screw means in clockwise and counterclockwise directions, said feed screw means extending within said specimen-exchanging chamber along the longitudinal coaxial direction of both said specimen-exchanging chamber and said specimen chamber, guide means disposed in parallel with said feed screw means, a removable nut means threaded through said feed screw means for moving slidably in a direction from said specimen-exchanging chamber to said specimen chamber and in an opposite direction from said specimen chamber to said specimen-exchanging chamber by a rotataional direction of said feed screw means, said nut means being formed monolithically with a moving means for removing a specimen holder mounted on said guide means and retaining a specimen for movement linearly between said specimen-exchanging chamber and said specimen chamber, and said moving means being provided with a specimen-chucking means for loading and unloading said specimen holder from said nut means.

4,705,951

WAFER PROCESSING SYSTEM

Frederick P. Layman, Fremont; David A. Huntley, Mountain View; Paul H. Dick, San Jose; George L. Coad, Lafayette; Michael J. Kuhlman, Fremont; Roger M. Vecta, San Jose, and Phillip M. Hobson, Los Altos, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Apr. 17, 1986, Ser. No. 853,274
Int. Cl.[4] G21K *5/10*; B65H *1/00*
U.S. Cl. 250—442.1 **16 Claims**



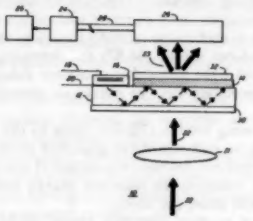
1. A semiconductor wafer processing machine, comprising:
a first loadlock means for receiving a cassette of semiconductor wafers for processing;
a second loadlock means for receiving processed wafers;
at least one processing chamber;
at least two wedge valves;
said first loadlock means being in communication with a wafer processing chamber through a first wedge valve when said first wedge valve is open;
said second loadlock means being in communication with a wafer processing chamber through a second wedge valve when said second wedge valve is open;
each said loadlock means, wedge valve and processing chamber being vacuum-tight and having means for attachment to an external vacuum pumping means;
computer means for controlling each said loadlock means, wedge valve and processing chamber;
each said wedge valve including;
a valve housing having input port and output port;
a valve wedge having surfaces sealing to said input and output ports, said valve wedge sealing surfaces being sloped relative to each other, said valve wedge having a storage notch between said sealing surfaces;
means for sliding said valve wedge within said housing from a sealing position to an open position so that said valve wedge is clear of a line sight through said input and output ports;
a workpiece handling arm capable of being stored in a folded position in said storage notch when said valve is closed.

4,705,952

COMMUNICATIONS APPARATUS USING INFRARED-TRIGGERED PHOSPHOR FOR RECEIVING INFRARED SIGNALS

Joseph Lindmayer, Potomac, Md., assignor to Quantex Corporation, Rockville, Md.

Filed Oct. 10, 1985, Ser. No. 786,095
Int. Cl.[4] G01T *1/11*
U.S. Cl. 250—484.1 **16 Claims**



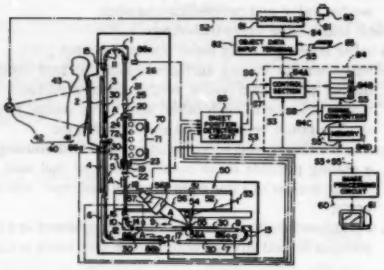
1. Optical conversion apparatus, comprising:
a phosphor of the type that stores energy absorbed in the form of electromagnetic radiation of a first frequency and releases energy in the form of electromagnetic radiation of a second frequency when triggered by electromagnetic radiation of a third frequency;
means for charging said phosphor with electromagnetic radiation of said first frequency;
means for receiving input signals of electromagnetic radiation of said third frequency containing information modulated thereon and for directing said input signals onto said phosphor, such that said phosphor generates output signals containing said information in the form of electromagnetic radiation signals of said second frequency;
means for converting said output signals into electrical signals containing said information; and
means for extracting said information from said electrical signals.

4,705,953

RADIATION IMAGE RECORDING AND READ-OUT APPARATUS WITH OBJECT DATA OUTPUT CAPABILITY

Tsutomu Kimura, and Yukio Watanabe, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 16, 1985, Ser. No. 787,944
Claims priority, application Japan, Oct. 16, 1984, 59-216902
Int. Cl.[4] G01T *1/105*
U.S. Cl. 250—484.1 **7 Claims**



1. A radiation image recording and read-out apparatus with object data output capability comprising:

(i) a circulation and conveyance means (26) for conveying at least one stimulate phosphor sheet (30) for recording a radiation image thereon along a predetermined circulation path,

(ii) an image recording section (40) positioned on said circulation path for recording a radiation transmission image of an object (43) on said stimulable phosphor sheet by exposing said stimulate phospher sheet to a radiation passing through said object,

(iii) an image read-out section (50) positioned on said circulation path and consisting of a stimulating ray source (51) for emitting stimulating rays (52) for scanning said stimulable phosphor sheet carrying said radiation image stored thereon in said image recording section, and a photoelectric read-out means (56,57) for detecting light emitted from said light stimulable phosphor sheet scanned with said stimulating rays to obtain an electric image signal (53).

(iv) an erasing section (70) for, prior to the next image recording on said stimulable phosphor sheet for which the image read-out has been conducted in said image read-out section, releasing the radiation energy remaining on said stimulable phosphor sheet,

(v) a sheet position detection means (85,86) for detecting which of the stimulable phosphor sheets are positioned in the image recording section and the image read-out section and outputting corresponding sheet position data (56,57),

(vi) an object data input section (82) for receiving data (55) related to the objects whose radiation images are to be recorded and for outputting the object data related to each object at the time its radiation image is recorded, and

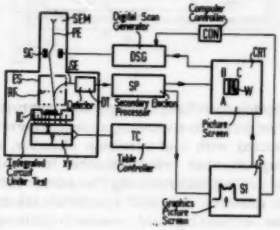
(vii) a signal output control circuit (84) for receiving the object data output by the object data input section and the sheet position data output by the sheet position detection means, storing the object data in a memory means (84B) in association with the stimulable phosphor sheet positioned at the image recording section at the time the object data is received based on the sheet position data received from the sheet position detection means, reading out the object data stored in the memory means in association with the respective stimulable phosphor sheets at the time the radiation images are read out from the respective stiumulable phosphor sheets in the image read-out section, and outputting data signals (55) corresponding to the object data for the respective stimulable phosphor sheets together with signals (53) corresponding to the radiation images recorded thereon.

4,705,954

METHOD AND APPARATUS FOR AUTOMATICALLY POSITIONING A PARTICLE BEAM

Peter Rummel, Festenbach, and Eckhard Wolfgang, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 19, 1985, Ser. No. 766,448
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1984, 3432479
Int. Cl.[4] G01N *23/225*
U.S. Cl. 250—491.1 **7 Claims**



1. A method for automatically positioning a particle probe to a center of an electrical interconnect having a longitudinal extent and laying within a general region on a specimen wherein an apparent position shift of the electrical interconnect from its actual position, which may occur due to local fields, is compensated, comprising the steps of:

positioning the particle probe to the general region and moving the particle probe within said general region along a first scan line path either alongside the interconnect without intersecting the interconnect or directly on the interconnect without leaving the interconnect, and along a second scan line path which is transverse to the longitudinal extent of the interconnect and which sweeps across the interconnect and also neighboring regions alongside the interconnect;

detecting measured signals triggered as a result of secondary electrons which result from incidence of said particle probe in said general regions and onto the interconnect; and

locating the center of the interconnect by utilizing increased contrast at edges of the interconnect in signals resulting from scanning along said second scan line path so as to locate the edges of the interconnect, and employing signals from scanning along said first scan line path for use in determining a noise background of the measured signals.

4,705,955

RADIATION THERAPY FOR CANCER PATIENTS

Curt Mileikowsky, c/o Instrument AB Scanditronix, Box 7412, 103 91 Stockholm, Sweden

Filed Apr. 2, 1985, Ser. No. 719,226
Int. Cl.[4] G01N *21/00*; H01J *37/00*
U.S. Cl. 250—492.1 **57 Claims**

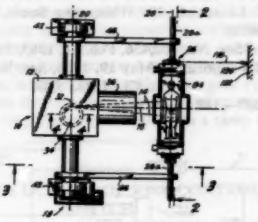
1. Apparatus for irradiating a patient and comprising:

a source of a radiation beam directed along a radiation axis;

means mounting said source for pivotal movement about a first horizontal axis which intersects said source, is stationary with respect to said apparatus, and extends in a direction substantially normal to said radiation axis, whereby said beam is capable of an angular scan in a vertical plane;

table means adapted to support a patient to be irradiated; and

suspension means mounted said table means for arcuate movement to any of a plurality of positions angularly spaced about said first horizontal axis and for pivoting movement about a second horizontal axis displaced from and substantially parallel to said first horizontal axis, said



suspension means maintaining said second horizontal axis in substantially intersecting relation to said radiation axis in each of said positions while maintaining a fixed angular position of said table means with repsect to the environment.

4,705,956

ELECTRON IMAGE PROJECTOR

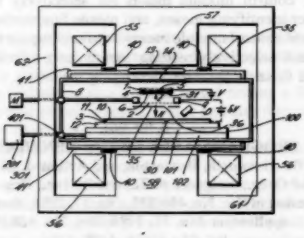
Rodney Ward, Crawley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 27, 1985, Ser. No. 716,413

Claims priority, application United Kingdom, Apr. 2, 1984, 8408479

Int. Cl.[4] H01J *37/00*

U.S. Cl. 250—492.2 **5 Claims**



1. An electron image projector for projecting with substantially unity magnification a beam of electrons emitted by a cathode onto a target under the action of an electric field, the projector comprising:

(a) an electron emissive cathode for emitting a beam of electrons having a predetermined spatial pattern,

(b) a target holder spaced from and disposed parallel to the cathode,

(c) an anode comprising a grid having an array of electron permeable regions, the array being at least as extensive as the spatial pattern, which grid is spaced from and disposed intermediate and parallel to the cathode and the target holder,

(d) a vacuum chamber surrounding the cathode, the anode grid and the target,

(e) means for producing a substantially uniform electric field between the cathode and the anode grid,

(f) means for producing a substantially uniform magnetic field parallel to the electric field to focus the beam pattern onto the target,

(g) means disposed generally adjacent to the space between the grid and the target holder for detecting electrons back scattered from reference markers on the target, and

(h) means for moving the target incrementally in its own plane relative to the cathode,

characterized in that the means for producing the magnetic field comprises: an electromagnet having two ferromagnetic pole pieces, each of the pole pieces having a cross-sectional area greater than that of the cathode and each of the pole pieces surrounded by a respective solenoid;

and further characterized in that the vacuum chamber containing the cathode, the anode grid and the target holder is disposed between these pole pieces, the vacuum chamber framed by yoke means extending between the two pole pieces, the yoke means comprising a plurality of spaced apart bars allowing access to the vacuum chamber.

4,705,957

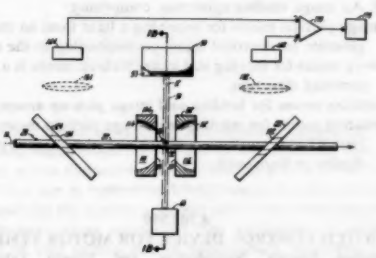
WIRE SURFACE MONITOR

Leroy G. Puffer, Vernon, and Robert K. Erf, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 11, 1986, Ser. No. 895,418

Int. Cl.[4] G01N *21/88*

U.S. Cl. 250—56 B **6 Claims**



1. A surface-defect detection device for identifying the presence of defects on the surface of a wire traveling along an axis from an upstream direction toward a downstream direction and comprising:

light means for illuminating an azimuthal zone of said wire having a predetermined illumination zone length along said axis;

at least two light reflecting means having a non-planar reflective surface disposed on upstream and downstream sides of said illumination zone;

at least two radiation detectors disposed to receive radiation reflected from defects on said surface of said wire and to emit signals having a signal magnitude related to the magnitude of scattered radiation; and

electronic means for combining signals from said radiation detectors to produce a flaw detection signal; characterized in that:

said non-planar reflective surfaces are azimuthally symmetric about said axis and each define a reflective volume in an interior portion thereof;

said at least two radiation detectors are disposed outside said reflective volumes and at a predetermined distance from said illumination zone; and

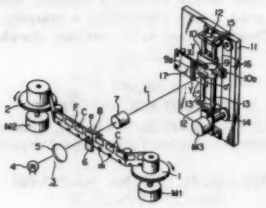
said device further includes upstream and downstream azimuthally symmetric reflective surfaces positioned along said axis and having an aperture for the passage of said wire therethrough, oriented to direct toward a corresponding radiation detector both radiation scattered directly from a surface defect and radiation that is first scattered from said surface defect and then is reflected from a corresponding one of said non-planar reflective surfaces, whereby said radiation detectors are substantially equally responsive to surface flaws in all azimuthal positions of said wire.

4,705,958

APPARATUS FOR READING AN ARBITRARILY ORIENTED IMAGE

Yasutoshi Sugita, Urayasu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1985, Ser. No. 726,827
Claims priority, application Japan, May 10, 1984, 59-93613; May 15, 1984, 59-97309; May 25, 1984, 59-106713
Int. Cl.[4] G03B *27/465;* H04N *1/028*
U.S. Cl. 250—578 11 Claims



9. An image reading apparatus, comprising:

image pick-up means for receiving a light from an image to generate an electrical signal corresponding to the image;

drive means for moving said image pick-up means in a predetermined direction;

holding means for holding said image pick-up means; and

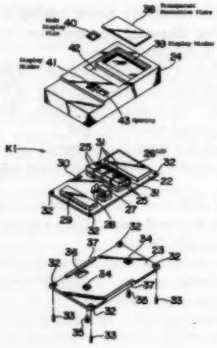
rotating means for rotating said image pick-up means by at least 90° in accordance with whether the image is perpendicular or horizontal.

4,705,959

SWITCH CONTROL DEVICE FOR MOTOR VEHICLE

Yasuhiro Kiyono, Nagaokakyo, and Yutaka Takeyama, Toyonaka, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation-in-part of Ser. No. 762,471, Aug. 5, 1985. This application Nov. 13, 1986, Ser. No. 929,851
Claims priority, application Japan, Aug. 7, 1984, 59-165323
Int. Cl.[4] H01H *9/26*
U.S. Cl. 307—9 5 Claims



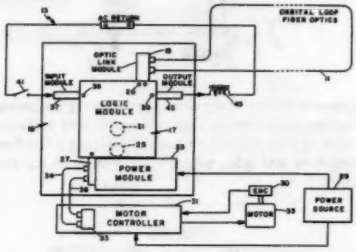
1. A switch control device for a motor vehicle comprising a plurality of switches for actuating a plurality of apparatuses of said vehicle, said plurality of switches comprising at least one stop mode switch having a first push face defining a first plane and at least one moving mode switch having a second push face defining second plane, wherein said at least one stop mode switch is located adjacent said at least one moving mode switch, and said first plane is spaced apart from said second plane.

4,705,960

CONTROL DEVICE INCLUDING A CONDUCTIVELY ISOLATED DEPLUGGABLE CONTROLLER

Rodger T. Lovrenich, 209 Whispering Sands, Santa Teresa, N. Mex. 88008

Division of Ser. No. 700,456, Feb. 11, 1985, Pat. No. 4,621,200. This application May 19, 1986, Ser. No. 864,601
Int. Cl.[4] H02J *3/00*
U.S. Cl. 307—149 8 Claims



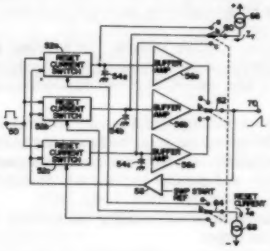
1. A control station constructed for use in a multi-station control system in an automated production line or the like, said control station comprising station support structure, control module means including means for removably mounting said control module means to said support structure, means on said support structure for identifying station character to said control module means mounted on said support structure, means on said control module means for selectively reading said character-identifying means, and means functioning in mounting of said control module means onto said support structure to bring said selectively-reading means into operable position adjacent to said character-identifying means.

4,705,961

PROGRAMMABLE SWEEP GENERATOR

Walter W. Ainsworth, Beaverton, and Arthur J. Metz, Gervais, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 458,239, Jan. 17, 1983, abandoned. This application Jan. 21, 1986, Ser. No. 820,590
Int. Cl.[4] H03K *4/08, 4/84*
U.S. Cl. 307—228 9 Claims



1. A sweep generator comprising:

a source of timing current;

an amplifier having an input terminal and producing an output voltage in proportion to an input voltage at said input terminal, said timing current being applied to said input terminal;

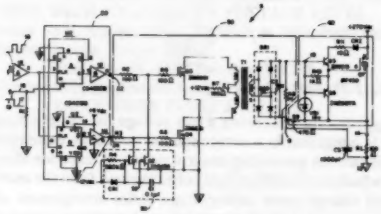
a timing capacitor connected between said input terminal and point of common reference potential;
means for receiving a sweep gate signal;
a source of constant reset current; and
means coupled to said sweep gate signal receiving means for connecting said reset current source to the input of said amplifier in the absence of said sweep gate signal, said reset current source thereby absorbing said timing current, discharging said timing capacitor and reducing said amplifier output voltage to a minimum level, and for disconnecting said reset current source from the input of said amplifier in response to said sweep gate signal, said timing current thereby charging said timing capacitor to increase the amplifier output voltage in a ramp fashion.

4,705,962

SOLID STATE DC RATE OF RISE CONTROLLED SWITCH

Roy Y. Kinoshita, Anaheim; Patrick E. McCollum, and Mark E. Colan, both of Yorba Linda, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 14, 1986, Ser. No. 918,235
Int. Cl.[4] H03K *17/56, 17/687*
U.S. Cl. 307—247.1 **9 Claims**



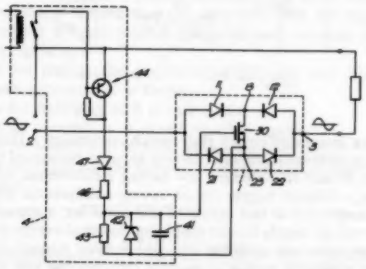
1. A solid state dc switch for switching power from a positive terminal of a ground referenced dc voltage source to a terminal of a ground referenced loaded, said solid state dc switch being responsive to a control signal having a first and second state from a control signal source and also responsive to a clock signal from a clock signal source,
said clock signal having a first and second state, said
solid state dc switch comprising:
divide-by-two circuit means coupled to said control signal source and to said clock signal source, said divide-by-two circuit means being being responsive to said clock signal and to said control signal first state for providing a first and second symmetrical output signals at a frequency of one-half the frequency of said lock frequency, said second symmetrical output signal being delayed in time by one-half period from said first output signal; said divide-by-two circuit means being reponsive to said control signal second state for interrupting said first and second symmetrical output signals;
transformer drive and rectifier means coupled to receive said first and second symmetrical output signals from said divide-by-two circuit means, said transformer drive and rectifier means being responsive to said first and second symmetrical output signals for providing an isolated dc signal having a high state in response to said first and second symmetrical output signals and for providing an isolated dc signal low state in response to interruption of said first and second symmetrical signals output;
an isolated switching means coupled to receive said isolated dc signal from said transformer drive and rectifier means said isolated switching means being responsive to said high state of said isolated dc signal for coupling said positive terminal of said ground referenced dc voltage source to the terminal of said ground referenced load, and for decoupling said positive terminal of said ground reference dc voltage source from the terminal of said ground referenced load in response to the low state of the isolated dc signal.

4,705,963

AC CONTROLLED DIODE SWITCH

Anton M. Bax, Forthampton, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Sep. 10, 1985, Ser. No. 774,426
Claims priority, application United Kingdom, Sep. 18, 1984, 8423574
Int. Cl.[4] H03K *17/74, 17/60, 5/159*
U.S. Cl. 307—257 **4 Claims**



1. An a.c. switch comprising: an alternating signal input; an alternating signal output; a first pair of unidirectional current devices; means connecting the unidirectional current devices of said first pair in back-to-back relationship in series between said input and the output; a second pair of unidirectional current devices; means connecting the unidirectional current devices of said second pair in back-to-back relationship in series between said input and said output in the opposite sense and in parallel with said first pair; a transistor switching device having a gate electrode; means connecting the transistor switching device between a junction between the unidirectional current devices of the said first pair and a junction between the unidirectional current devices of said second pair; a switching control circuit for selectively controlling switching of current between the said input and output for periods exceeding the period of an alternating signal at said input; means connecting said switching control circuit to control switching of said transistor switching device, said switching control circuit including a capacitor circuit comprising a capacitor and a resistor connected across said capacitor and having a time constant, a voltage source, a second switching device; and means connecting said capacitor circuit between said gate electrode of the transistor switching device and said voltage source via said second switching device, said second switching device being connected to receive an alternating signal, said second switching device being controlled by said alternating signal intermittently to pass current to charge said capacitor, the charge on said capacitor controlling switching of the transistor switching device and the time constant of said capacitor circuit being such that the transistor switching device remains conductive for periods exceeding the period of an alternating signal at the input despite switching of said second switching device caused by alternation of said alternating signal and signal current flows between said input and output via a unidirectional current device in each of said first and second pairs and via said transistor switching device, and such that when the alternating signal is not applied to said second switching device prevents charging of said capacitor means thereby causing said transistor switching device to become non-conductive and thereby substantially blocking signal current flow between the said input and output.

4,705,964

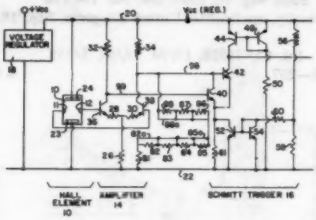
INTEGRATED CIRCUIT HALL SWITCH WITH ADJUSTABLE OPERATE POINT

Jacob K. Higgs, Salisbury, N.H., assignor to Sprague Electric Company, North Adams, Mass.

Filed Sep. 29, 1986, Ser. No. 912,709

Int. Cl.[4] H01H 36/00; H01L 43/06

U.S. Cl. 307—278 11 Claims



1. An integrated circuit Hall switch comprising a Hall element, a differential amplifier having an input connected to the output of said Hall element and having a differential voltage output; a Schmitt trigger circuit having a differential voltage input connected to said output of said amplifier; a ground bus and a voltage supply bus for supplying electrical energy to said Hall element, said amplifier and said Schmitt trigger circuit; and an adjustable resistor connected, between one side of said output of said amplifier and said ground bus, by which the operate point of said Hall switch is adjustable.

4,705,965

INTERFERENCE FREE D-TYPE FLIP-FLOP

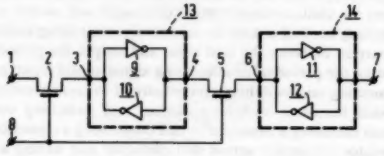
Johannes J. Stuyt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 26, 1985, Ser. No. 780,528

Claims priority, application Netherlands, Oct. 1, 1984, 8402986

Int. Cl.[4] H03K 3/26, 3/284, 21/16, 19/094

U.S. Cl. 307—279 11 Claims



1. An electronic flipflop circuit comprising: a data input, a data output, a clock signal input, a first transmission gate for transferring binary data appearing on the data input to an input of a first storage element under the control of a clock signal at the clock signal input, a second transmission gate for transferring, under the control of the clock signal, binary data appearing on an output of the first storage element to an input of a second storage element having an output which constitutes said data output, each transmission gate including only one insulated gate field effect transistor having a channel serving for the transfer of the binary data, gate electrodes of said transistors in the transmission gates receiving the same clock signal, the transistor in the first transmission gate being of a first conductivity type and the transistor in the second transmission gate being of a second conductivity type, wherein the storage elements each include a forward and a reverse inverter coupled together so that a first junction of an output of the reverse inverter and an input of the forward inverter form the input of the storage element and a second junction of an output of the forward inverter and an input of the reverse inverter form the output of the storage element, the forward inverter in at least one storage element having a change-over voltage which deviates from a mean value of two logic output levels of said circuit by at least 10 percent of a logic voltage step, the change-over voltage being higher than said mean value for a transmission gate at the input of the storage element which includes a P-type field effect transistor, and being lower for a transmission gate that includes an N-type field effect transistor.

4,705,966

CIRCUIT FOR GENERATING A SUBSTRATE BIAS

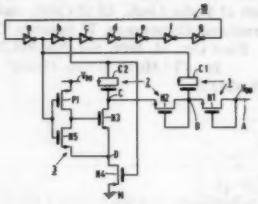
Adrianus T. Van Zanten, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 5, 1985, Ser. No. 772,790

Claims priority, application Netherlands, Sep. 11, 1984, 8402764

Int. Cl.[4] H03K 3/01

U.S. Cl. 307—296 R 19 Claims



1. A circuit for generating a bias voltage for another circuit which is integrated in a semiconductor substrate, comprising: an oscillator for generating control pulses, at least one charge pump which receives electrical pulses derived from the oscillator, said charge pump comprising a series arrangement of a capacitance and a diode in which said electrical pulses are applied to a first electrode of the capacitance, a second electrode of the capacitance being connected to the diode associated with the capacitance, means connecting an output of the charge pump to the substrate, means connecting a junction point of the capacitance and the diode of the charge pump to a ground point of the integrated circuit via first and second series connected insulated-gate switching transistors, said first switching transistor having a control electrode connected to a control circuit which receives the control pulses, said second switching transistor having a control electrode which receives the electrical pulses for the charge pump, the control pulses being applied to the control electrode of the first switching transistor after having been inverted by the control circuit, and wherein the control circuit includes a transistor that effectively connects the control electrode of the first switching transistor to one main electrode of the first switching transistor when a control pulse is applied to the control circuit.

4,705,967

MULTIFUNCTION FLOATING FET CIRCUIT

Carmine F. Vasile, Huntington, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,373

Int. Cl.[4] H03K 3/353, 17/60; G06G 7/00; H03F 3/04

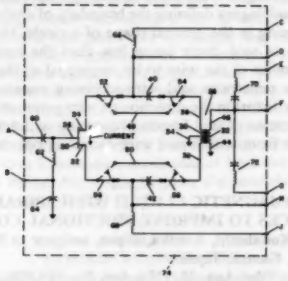
U.S. Cl. 307—304 37 Claims

1. A floating field-effect transistor circuit comprising:

an FET device having source and drain terminals, and having symmetrical source and drain characteristics permitting interchanging the source and the drain terminals as a function of voltages between these terminals and a gate terminal;

a balun having a first balanced terminal connected to the source terminal of said FET device and having a second balanced terminal connected to the drain terminal of said

FET device, said balun having an unbalanced terminal serving to couple signals between said balun and a point external to said FET device; and



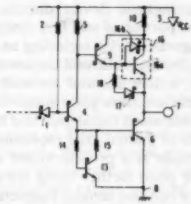
circuit means for providing a balanced connection between said FET device and an external source of power.

4,705,968

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH HIGH BREAKDOWN VOLTAGE LEVEL

Youichirou Taki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1985, Ser. No. 738,718
Claims priority, application Japan, May 30, 1984, 59-112491
Int. Cl.[4] H03K *19/088, 3/313, 3/33*
U.S. Cl. 307—456 5 Claims



1. A semiconductor integrated circuit device comprising a first plurality of Schottky barrier diodes and a plurality of transistors, each of said transistors having a first terminal, a second terminal, and a third terminal and conducting through its first and second terminals, its third terminal comprising a base electrode to which a potential is applied to render the transistor conductive, said plurality of transistors comprising:

a first transistor having its third terminal connected to an input signal line and its first terminal connected to a first potential source;

a second transistor having its third terminal connected to the second terminal of said first transistor, its second terminal connected to a second potential source, and its first terminal connected to an output terminal;

a third transistor having its third terminal connected to the first terminal of said first transistor and its first terminal connected to said first potential source; and

a fourth transistor having one of said first plurality of Schottky barrier diodes connected between its first and third terminals, its third terminal further connected to the second terminal of said third transistor, its second terminal connected to said output terminal, and its first terminal further connected to the first terminal of said third transistor,

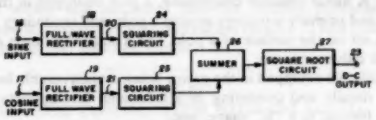
said first plurality of Schottky barrier diodes further comprising a second Schottky barrier diode connected between the first terminal of said second transistor and the third terminal of said fourth transistor.

4,705,969

HIGH ACCURACY TACHOMETER CIRCUIT

William H. Gross, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 19, 1986, Ser. No. 909,385
Int. Cl.[4] G06G *7/20*
U.S. Cl. 307—519 4 Claims



1. A tachometer circuit having sine and cosin signal inputs representative of the rotation rate of a shaft and said signal inputs have a frequency proportional to said rotation, said circuit comprising:

means for making the amplitude of said sine and cosine signals proportional to frequency;

means for rectifying each of said inputs;

means for squaring each of said rectified signals;

means for adding said squared signals together; and

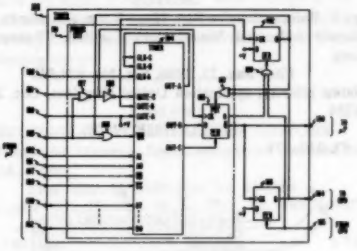
means for exracting the square root of said added together signals.

4,705,970

PROGRAMMABLE INTERVAL TIMER WITH LOCK MEANS

George F. Turnpaugh, Naperville, Ill., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 4, 1985, Ser. No. 697,880
Int. Cl.[4] H03K *5/19;* H03M *13/00*
U.S. Cl. 307—600 12 Claims



1. A programmable interval timer for generating an error signal when a timing signal is received outside a predetermined time frame, comprising:

timer means having minimum and maximum timing intervals determining said predetermined time frame and responsive to first and second data input signals for setting said minimum and maximum timing intervals, respectively, and further responsive to first and second timing signals for generating a first output signal when the time interval between said first and second timing signals is less than said minimum timing interval and a second output signal when the time interval between said first and second timing signals is greater than said maximum timing interval;

latch means for generating said error signal in response to one of said first and second output signals; and

lock means connected to said timer means and responsive to a first receipt of one of said first and second timing signals for preventing said timer means from responding to one of said first and second data input signals.

4,705,971
LINEAR RESOLVER

Nagahiko Nagasaka, Iruma, Japan, assignor to Kabushiki Kaisha Yaskawa Denki Seisakusho, Fukuoka, Japan

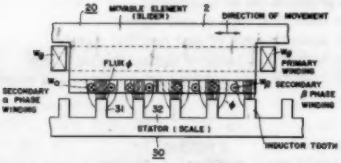
Filed Nov. 8, 1985, Ser. No. 796,552
Claims priority, application Japan, Feb. 15, 1985, 60-27617
Int. Cl.[4] H02K 41/00
U.S. Cl. 310—12 4 Claims

1. A linear resolver comprising, a pole equipped in the motor, and primary windings around a pole, and secondary windings set on the surface of a pole, and a stator having a modulated inductor tooth:

said pole equipped in the motor being manouverable longitudinally and consisting of a laminated feromagnetic core formed in a "E" shape, and,

said primary windings, wound in single phase and excited by AC current, and,

said secondary windings acting as detecting coils, set on the surface of the abovementioned pole, and formed in printed coils or the like, and connected in two phase and disposed



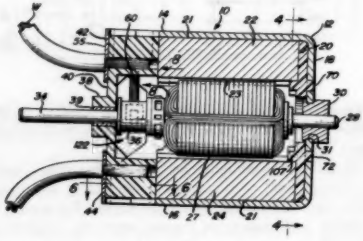
at a 90 degree electro-magnetic angle from each other, and,

said stator, facing said secondary windings, toothed in equal pitch along its longitudinal direction, and formed at twice the pitch of the secondary winding's pitch.

4,705,972
SOLDERLESS ELECTRICAL CONNECTION IN A MOTOR

Roger F. Baines, Repulse Bay, Hong Kong, assignor to Johnson Electric Industrial Manufactory Limited, Chaiwan, Hong Kong

Filed Jan. 23, 1986, Ser. No. 824,549
Claims priority, application United Kingdom, Oct. 24, 1985, 8526254
Int. Cl.[4] H02K 11/00
U.S. Cl. 310—71 8 Claims



1. A device for making a solderless electrical connection between a wire and an electrical motor comprising:

an integral U-shaped electrical conductive body including

a pair of opposed parallel legs and a central portion joining said parallel legs;

mounting means extending from said parallel legs for mounting said body to a motor;

an elongated resilient extension member integrally protruding from one of said legs and terminating at its other end spaced from said one leg, said other end being free;

a brush leaf forming the free end of said elongated resilient extension member;

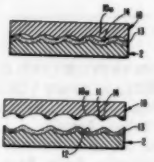
said central portion having an aperture with a greater cross-sectional area than the cross-sectional area of a wire to be connected; and

a plurality of symmetrically arranged resilient fingers extending into the plane of said aperture, the distal ends of said fingers defining the boundary of a wire-receiving opening in the general shape of a circle, the cross-section of said circle being less than the cross-sectional diameter of the wire to be connected so that when the wire penetrates said wire-receiving opening, said fingers distort in the direction of wire penetration, and the distortion of said fingers preventing withdrawal of said wire from within said wire-receiving opening.

4,705,973
ELECTROMAGNETIC CLUTCH WITH SPIRAL PLATED SURFACES TO IMPROVE FRICTIONAL CONTACT

Takatoshi Koitabashi, Annaka, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Aug. 25, 1986, Ser. No. 899,901
Claims priority, application Japan, Aug. 23, 1985, 60-184063
Int. Cl.[4] H02K 7/108
U.S. Cl. 310—78 4 Claims

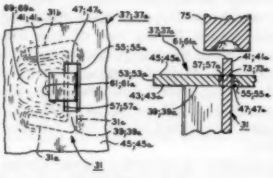


1. In an electromagnetic clutch including a first rotatable member of magnetic material rotatably supported on a bearing, an annular electromagnetic device disposed in a stationary position in a hollow portion of said first rotatable member, said annular electromagnetic device including an annular magnetic housing and a annular magnetic coil disposed therein, a second rotatable member, a hub secured on said second rotatable member, a magnetic armature plate supported on and around said hub at a predetermined radial gap, said magnetic armature plate being capable of limited axial movement and facing said first rotatable member at a predetermined axial air gap, said magnetic armature plate further being attracted to said first rotatable member when said annular magnetic coil is energized such that a first frictional surface of said first rotatable member contacts a second frictional surface of said magnetic armature plate, the improvement comprising each of said frictional surfaces having grooves forming a spiral pattern and one of said frictional surfaces having a layer of metal plating with a hardness lower than that of said magnetic material.

4,705,974
DYNAMOELECTRIC MACHINE

Robert W. White, DeKalb, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 506,344, Jun. 21, 1983, Pat. No. 4,549,346.
This application Mar. 25, 1985, Ser. No. 715,869
Int. Cl.[4] H02K 15/14, 5/00
U.S. Cl. 310—89 22 Claims



22. A dynamoelectric machine comprising:

at least one end frame including a pair of generally opposite

faces, and a set of apertures intersecting with said opposite faces, respectively;

a stator;

a set of means associated with said stator for supporting said at least one end frame in an assembly position thereon, said supporting means including a set of means extending through said apertures and deformed into engagement with one of said opposite faces for retaining said at least one end frame against axial displacement from the assembly position thereof, a set of means for abutment with the other of said opposite faces, and a set of deformed sections on said at least one end frame associating said other opposite face thereof in locking relation with said abutment means to at least in part retain said at least one end frame against radial displacement from the assembly position thereof, respectively.

4,705,975

SYNCHRO-GENERATOR

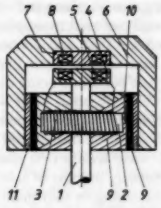
Georg Ritzinger, Klosterneuburg, Austria, assignor to Voest-Alpine Automotive Gesselschaft, Linz, Austria

Filed Jul. 25, 1986, Ser. No. 890,311

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1985, 3527226

Int. Cl.[4] H02K *19/00*

U.S. Cl. 310—162 **3 Claims**



1. A synchro-generator comprising a stator including at least two signal windings, each signal winding being offset a predetermined angle relative to each other signal winding, and a rotor, which carries an exciter winding, characterized in that:

said stator comprises an axially aligned cylindrical coil provided with obliquely wound signal windings,

said rotor further comprises a rod core having two longitudinal ends carrying said exciter winding, each longitudinal end of the rod core faceing and defining an air gap with the inside surface of said cylindrical coil, and

a shell of low-reluctance metal circumferentially surrounds said cylindrical coil for the greater part of the axial extension of said cylindrical coil.

4,705,976

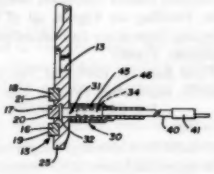
SLIP RING ASSEMBLY AND METHOD OF MANUFACTURE

Joseph C. Cacioppo, Akron; Donald R. Wuerzer, Uniontown, and Peter J. Piglia, Stow, all of Ohio, assignors to National Machine Company, Inc., Stow, Ohio

Filed Apr. 30, 1986, Ser. No. 857,319

Int. Cl.[4] H01R *39/08*

U.S. Cl. 310—232 **7 Claims**



1. A slip ring assembly for mating engagement with brushes to electrically connect fixed and relatively rotating elements comprising, a plurality of concentric annular conducting ring means having spaced axial faces, one face of each of said ring means being exposed for engagement by the brushes with the other face having a plurality of electrically conducting projecting stud means mechanically attached and electrically interconnected thereto, an insulating material isolating each of said ring means and encompassing a portion of said stud means, and enlarged head means on said stud means having a diameter greater than the radial dimension of said ring means and positioned within said insulating material, thereby providing a mechanical interlock of said stud means relative to said insulating material and said ring means.

4,705,977

MOLDED COMMUTATOR WITH ENLARGED DIAMETER RISER SECTION

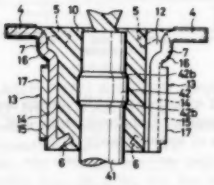
Takashi Shibata, Isesaki; Nobuo Yamada; Yoshikazu Mada, both of Kiryu, and Masaki Iizima, Niisato, all of Japan, assignors to Mitsuba Electric Manufacturing Co., Ltd., Gunma, Japan

Filed Jul. 30, 1986, Ser. No. 892,133

Claims priority, application Japan, Feb. 10, 1986, 61-18002; May 8, 1986, 61-106249

Int. Cl.[4] H01R *43/08;* **H02K** *15/00*

U.S. Cl. 310—235 **6 Claims**



1. A commutator of the type in which a parent metal of commutator segments is covered with a protecting cover on at least its surface for contacting with brushes, wherein said commutator segments are provided with a bulge at an end portion of said parent metal, the outer surfaces of said bulging portions being generally coextensive with the outer surface of said protecting cover.

4,705,978

BRUSHGEAR FOR MINIATURE MOTORS

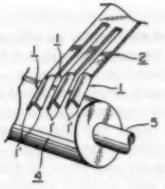
Takaichi Mabuchi, Matsudo, Japan, assignor to Mabuchi Motor Co., Ltd., Japan

Filed Mar. 10, 1986, Ser. No. 838,105

Claims priority, application Japan, Mar. 12, 1985, 60-48744

Int. Cl.[4] H02K *13/00*

U.S. Cl. 310—248 **1 Claim**



1. Commutator brushgear for miniature motor having a rotating shaft with a commutator, comprising a pair of brushes having brush shoes made of electrically conductive metal strips for making sliding contact with said commutator, at least one of said brush shoes being of V-shaped cross section having two spaced apart feet each with ends in sliding contact with said commutator, said two spaced apart feet being oriented so that they are inclined in axial direction of said rotating shaft of

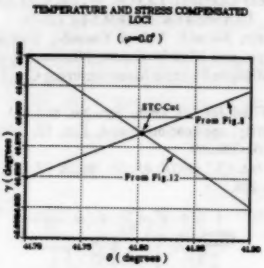
said motor at a predetermined angle with respect to a commutator surface.

4,705,979

STRESS AND TEMPERATURE COMPENSATED SURFACE ACOUSTIC WAVE DEVICES

Bikash K. Sinha, West Redding, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jun. 26, 1985, Ser. No. 749,289
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—313 A **32 Claims**



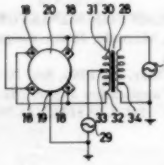
1. A rotated Y-cut, quartz SAW device having a propagation direction gamma of approximately 46.9° and an angular orientation theta of approximately 41.8°.

4,705,980

DRIVE CONTROL METHOD OF ULTRASONIC VIBRATOR

Shoji Mishiro, Kanagawa, Japan, assignor to Taga Electric Co., Ltd., Tokyo, Japan

Filed Sep. 24, 1986, Ser. No. 910,981
Claims priority, application Japan, Apr. 21, 1986, 61-91881
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—323 **11 Claims**



1. A drive control method for an ultrasonic vibrator having an electrostrictive element constituted by a electrostrictive element body polarized in the direction of its thickness and pairs of electrodes each electrode of said pairs being peripherally divided into two segments formed on one face thereof and a common on the other face thereof, said vibrator further having metallic members shaped in such a form that the flexural resonant frequency and the axial resonant frequency are equal and wherein said metallic members are integrally fastened by means of a fastener onto both faces of at least one sheet of said electrostrictive element body, the drive control method of said ultrasonic vibrator comprising the steps of:

applying flexural driving outputs to each of the respective electrodes forming the pairs in said electrostrictive member wherein the flexural drive output applied to one of each of said pair is phase inverted when compared to the flexural drive output applied to the other of each of said pairs;

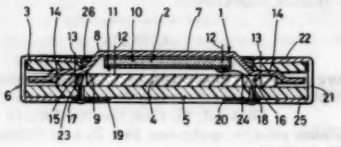
applying a common axial driving output to each of said electrodes respectively wherein said common axial driving output is superimposed with said flexural driving output.

4,705,981

ULTRASONIC TRANSDUCER

Jiro Inoue, and Masaharu Kota, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jan. 28, 1987, Ser. No. 7,734
Claims priority, application Japan, Jan. 29, 1986, 61-12159[U]
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—324 **12 Claims**



1. A compact ultrasonic transducer comprising:

a metal diaphragm having an upwardly directed first major surface and a downwardly directed second major surface, said diaphragm having a main plane and a bulged portion which projects upwardly of said main plane, said bulged portion being formed by first and second substantially circular bend lines, said second bend line being in said main plane, and said first bend line being disposed upward and radially inward of said second bend line;

a piezoelectric element bonded to said second major surface in said bulged portion, for causing said diaphragm to vibrate in a bending mode with a first node line being in said bulged portion radially inward of said first bend line; and a second node line being in said main plane, radially outward of said second bend line;

first and second elastic members contacting said first and second major surfaces, respectively, along said second node line of said diaphragm;

a base supporting said second elastic member and thereby supporting said diaphragm; and

a case having a peripheral wall portion, said peripheral wall portion surrounding a peripheral edge portion of said base and being secured to said base, said case further having a top portion which contacts said first elastic member and has an opening defined therein for receiving said bulged portion of said diaphragm, whereby said diaphragm is held and retained between said base and said top portion of said case via said first and second elastic members, with said bulged portion of said diaphragm projecting upwardly of said top portion of said case.

4,705,982

DEVICE FOR SUPPORTING A PIEZOELECTRIC RESONATOR INSIDE A CASING

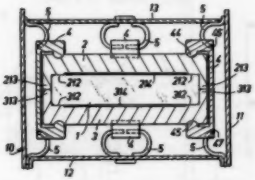
Raymond Besson, Besancon; Richard Delaite, Belfort; Gérard Genestier; Pierre Maitre, both of Besancon; Georges Renard, Pouilley-Francais; Daniel Thiebaud, Besancon, and Jean-Pascal Valentin, Pouilley les Vignes, all of France, assignors to Ecole Nationale Superieure de Mecanique et des Microtechniques, Besancon, France

Filed Jun. 10, 1986, Ser. No. 872,530
Claims priority, application France, Jun. 14, 1985, 85 09097
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—356 **8 Claims**

1. A piezoelectric device comprising a casing, a piezoelectric resonator and supporting means for supporting the piezoelectric resonator inside the casing wherein said supporting means comprises:

first and second identical half-shells for positioning the resonator, said half-shells being a material of same nature and

design as the material constituting the resonator, and each one being cross-shaped and comprising four branches of which the free ends define angle pieces with a horizontal hearing surface of small dimension, which surface is slightly raised with respect to the central part of the corresponding half-shell, as well as one vertical branch holding the edge of the resonator;



four identical independent securing flanges to secure the two half-shells in position, said flanges having the shape of a turned down U, each flange comprising, at the end of each branch of the U, two stop elements bearing against two superposed branches of the two half-shells, on the faces of those branches facing said horizontal bearing surfaces; and

at least four pairs of springs for suspending the four securing flanges with respect to the casing.

4,705,983

EASILY SERVICEABLE ALTERNATOR, PARTICULARLY FOR VEHICULAR USE

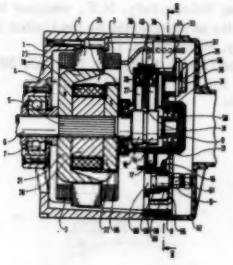
Herbert Franz, Stuttgart, and Gerhard Pflüger, Markgröningen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 693,261, Jan. 22, 1985, abandoned. This application Sep. 19, 1986, Ser. No. 910,249

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410759

Int. Cl.[4] H02K *11/00*

U.S. Cl. 310—68 D **8 Claims**



1. An easily serviceable alternator, particularly a vehicular-type alternator, having

a drive-side end shield (1);

a stator (2,3) secured to the drive-side end shield;

a drive-side bearing (7) secured in the drive side end shield;

a remote end shield (8) of plastic material secured to the drive-side end shield (1);

a remote bearing (9) located in the remote end shield;

a rotor (4, 5, 18, 20–24) journalled between the drive-side bearing (7) and the remote bearing (9), the rotor including a rotor shaft and slip rings located on the rotor shaft and positioned close to the remote bearing,

said alternator comprising,

a brush holder (30) integral with the remote end shield (8) and located inwardly of the end shield, extending radially within the end shield;

brushes (27, 28) retained in the brush holder (30) and each pressed into electrical contact with one of said slip rings by a compression spring;

a central hub (31) integral with said end shield (8), extending over and beyond the slip rings (10,11) on the shaft (5) of the rotor, and securing said remote bearing (9);

an attachment surface (35) located on the remote end shield (8) and extending transversely to the axis of rotation of the shaft (5) of the rotor;

a voltage regulator (25) attached to said attachment surface (35); and

a radial opening (33) formed in the remote end shield (8), extending essentially from a radially outer portion of the brush holder towards the outer circumference (34) of the end shield, and permitting direct access to said brushes (27, 28) retained in the brush holder (30), without detaching either of said voltage regulator (25) and said remote end shield (8), for possible maintenance or replacement of worn brushes to assure continued satisfactory electrical contact with said slip rings.

4,705,984

ELECTRICAL LAMP WITH A SCREW BASE FORMED BY IDENTICAL HALVES

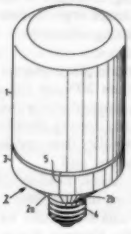
Johannes G. P. Mastboom, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 675,482, Nov. 28, 1984, abandoned. This application Aug. 28, 1986, Ser. No. 902,004

Claims priority, application Netherlands, Dec. 1, 1983, 8304139

Int. Cl.[4] H01J *5/48, 5/50*

U.S. Cl. 313—318 **9 Claims**



1. An electric lamp provided with a lamp envelope in which a light source is arranged, this lamp further comprising, between the lamp envelope and an Edison cap having a helically ascending thread, a cone-shaped lamp bowl which is composed of two halves and is provided at its wide part with a collar enclosing the lower side of the lamp envelope and at its narrow part with a neck-shaped portion the outer wall of which is provided with a helically ascending rib for screwing the Edison lamp cap, the two halves of the lamp bowl being placed against each other,

characterized in that the two lamp bowl halves are identical, the ascending rib being interrupted, viewed from the first bowl half to the second, at the seam between the two halves and then extending on the second bowl half so as to be axially offset, but with the same pitch,

whereby portions of said rib formed on one bowl half engage lower portions of said helically ascending thread, and portions of said rib on the other half engage upper portions of said helically ascending thread.

4,705,985

CATHODE-RAY TUBE AND ELECTRON GUN STRUCTURE THEREFOR

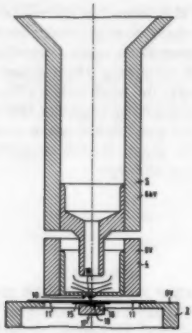
Martinus H. L. M. van den Broek, and Jan D. Westra, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 635,774, Jul. 30, 1984, abandoned. This application Nov. 25, 1986, Ser. No. 935,146

Claims priority, application Netherlands, Aug. 4, 1983, 8302754

Int. Cl.[4] H01J *29/56, 29/62*

U.S. Cl. 313—449 **8 Claims**



1. A cathode ray display tube comprising an envelope including a display window supporting a luminescent screen and containing means for producing a modulated electron beam directed at said screen, characterized in that said electron beam producing means comprises a diode electron gun for producing an electron beam having a current of at least 0.5 milliampere, said gun comprising, arranged in succession along an axis on which the electron beam is produced:

(a) a cathode for emitting electrons;

(b) an anode including:

(1) an apertured anode place spaced from the cathode by a distance less than 200 μm for cooperating with the cathode to form emitted electrons into a beam having a rectangular current density distribution, the thickness of said plate being smaller than one-half of the width of the aperture in the plate; and

(2) an electron-permeable field-shielding means extending across the aperture in said plate;

(c) first and second lens electrodes having respective apertures for passing the electron beam, said elecrodes being shaped to form therebetween a positive electron lens for focusing the beam into a cross-over; and

(d) means for producing a main focusing electron lens for focusing the cross-over to a spot having a diameter less than 600 μm on the luminescent screen.

4,705,986

HIGH COLOR RENDERING FLUORESCENT LAMP

Katsuaki Iwama, Suita City; Mutsuo Takahashi, and Haruo Shibata, both of Takatsuki, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Continuation of Ser. No. 707,866, Mar. 4, 1985, abandoned. This application Jan. 22, 1987, Ser. No. 8,144

Claims priority, application Japan, Aug. 2, 1984, 59-163313

Int. Cl.[4] H01J *61/48*

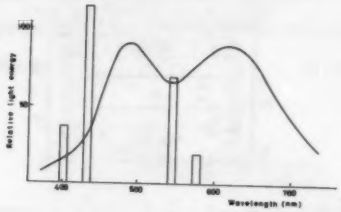
U.S. Cl. 313—487 **3 Claims**

1. A high color rendering fluorescent lamp having:

a transparent enclosure containing means for generating ultraviolet light,

a first phosphor layer which is provided on the inner face of said transparent enclosure and contains at least one of a phosphor of an alkaline earth metal halophosphate activated by antimony-manganese and a phosphor of alkaline earth metal halophosphate activated by antimony, and

a second phoshor layer which is provided further on said first phosphor layer and contains at least a phosphor of strontium-aluminate activated by divalent europium indicated by the general formula $Sr_{4-x}Eu_xAl_{14}O_{25}$, wherein



$0.02 \leqq x \leqq 0.80$, having a peak wavelength of emission at 470 nm–500 nm and absorbing the bright line spectrum of mercury in the visible short wavelength range, and at least one member selected from the group consisting of a phosphor of strontium-magnesium phosphate activated by tin having the formula $(Sr, Mg)_3(PO_4)_2$:Sn and a phosphor of strontium-barium-magnesium phosphate activated by tin having the formula $(Sr, Ba, Mg)_3(PO_4)_2$:Sn.

4,705,987

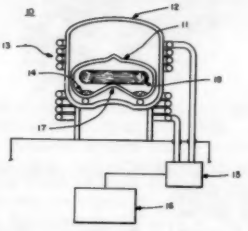
VERY HIGH EFFICACY ELECTRODELESS HIGH INTENSITY DISCHARGE LAMPS

Peter D. Johnson, Schenectady, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 3, 1985, Ser. No. 783,730

Int. Cl.[4] H01J *61/20, 61/30*

U.S. Cl. 313—634 **8 Claims**



1. An electrodeless arc lamp for forming a ring shaped plasma in a region therein during operation comprising a tube having a raised bottom center section, and an optically transparent outer jacket hermetically sealing said tube to protect said tube from cooling by convection, said raised center section rising centrally to form a ring shaped reservoir below the region in which the ring shaped plasma is formed to minimize wall cooling during operation of the lamp so that there is enhanced excitation near the center of the tube.

4,705,988

DEVICE FOR GUIDING AN ELECTRON BEAM

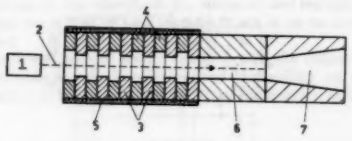
Minh Q. Tran, Lausanne, Switzerland, and Anders Bondeson, Gothenburg, Sweden, assignors to Centre de Recherches en Physique des Plasma (CRPP), Lausanne, Switzerland

Filed Sep. 9, 1985, Ser. No. 773,665

Claims priority, application Switzerland, Oct. 2, 1984, 4727/84

Int. Cl.[4] H01J *25/00*

U.S. Cl. 315—4 15 Claims



1. A device for guiding an electron beam from an electron gun to a microwave resonator in a microwave source operating in accordance with the gyrotron principle, comprising:

a beam duct including an electrically conductive wall, said beam duct enclosing the electron beam along a direction of propagation of the electron beam;

means provided inside the beam duct for damping unwanted wave modes, said damping means comprising a plurality of damping openings provided in said wall of said beam duct, said damping openings have a characteristic aperture size (a) which is larger or approximately equal to a wavelength of wave modes to be damped.

4,705,989

MAGNETRON WITH A CERAMIC STEM HAVING A CATHODE SUPPORT STRUCTURE

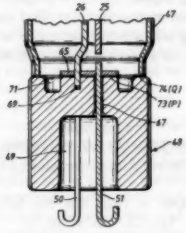
Kousuke Takada, Kawasaki, and Akira Kousaka, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1985, Ser. No. 812,858

Claims priority, application Japan, Dec. 28, 1984, 59-274721

Int. Cl.[4] H01J *25/50*

U.S. Cl. 315—39.51 14 Claims



1. A magnetron comprising:

a cylindrical anode with a plurality of vanes;

a cylindrical metal sleeve forming part of an evacuated envelope having one open end hermetically sealed to said cylindrical anode;

a cathode positioned coaxially withing said anode;

a pair of cathode support rods supporting said cathode;

a ceramic stem provided with through-holes and hermetically sealed to the other open end of said cylindrical metal sleeve;

outer connecting leads extending through the through-hoes of said ceramic stem to the cathode side of said ceramic stem; and

sealing metal plates fixed to the cathode side of said ceramic stem and comprising means for hermetically sealing said through-holes, for electrically connecting said outer connecting leads at the through-hole sealing positions, for supporting said cathode support rods at positions adjacent to the sealed positions of the through-holes on the cathode side of said ceramic stem, and for electrically connecting said cathode support rods to said outer connecting leads.

4,705,990

TUNABLE MAGNETRON

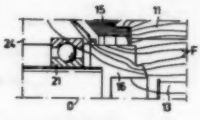
Andras Agoston, Täby, and Lennart P. J. Mattsson, Vallentuna, both of Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 19, 1985, Ser. No. 799,420

Claims priority, application Sweden, Nov. 23, 1984, 8405917

Int. Cl.[4] H01J *25/50*

U.S. Cl. 315—39.55 5 Claims



1. A tunable magnetron comprising:

(a) coaxially-arranged cathode and anode systems defining therebetween an annular evacuated interaction space;

(b) a rotatable tuning body including an annular portion having a circumferentially-varying conductivity disposed proximate the anode system in an evacuated space communicating with the interaction space, said rotatable tuning body during rotation effecting a periodic variation of the frequency to which the magnetron is tuned;

(c) a magnetic circuit comprising first and second pole elements situated on opposite sides of the interaction space for producing a magnetic field directed axially through said interaction space; and

(d) means for rotatably supporting the rotatable tuning body and including at least one rolling bearing disposed proximate the magnetic circuit, said rolling bearing comprising rolling bodies consisting essentially of a non-magnetic material, thereby avoiding variations in the magnetic field caused by movement of said rolling bodies.

4,705,991

METHOD OF OPERATING A HIGH-PRESSURE METAL VAPOR DISCHARGE LAMP AND CIRCUIT ARRANGEMENT FOR CARRYING OUT THIS METHOD

Hans G. Ganser, Stolberg; Reinhard Kersten; Rolf Schäfer, both of Aachen, and Hans P. Stormberg, Stolberg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 27, 1982, Ser. No. 382,735

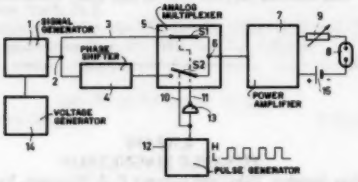
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1981, 3122183; Jan. 27, 1982, 3202499

Int. Cl.[4] H05B *37/02*

U.S. Cl. 315—209 R 18 Claims

1. A method of operating a high-pressure metal vapour discharge lamp at a frequency above 500 Hz comprising: producing a periodic lamp operating voltage with a frequency

greater than 500 Hz, and suddenly varying the phase of said lamp operating voltage at given time intervals so as to minimize the occurrence of acoustic resonance effects in a high-pressure metal vapour discharge lamp.

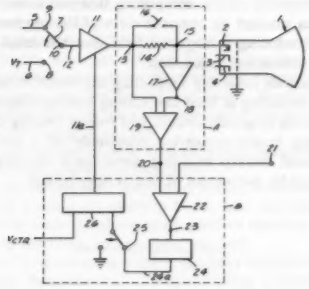


4,705,992

SYSTEM FOR STABILIZING CATHODE EMISSIONS WITH AN IN-LINE GUN CATHODE RAY TUBE

Dan N. Ciocan, Rowland Heights, Calif., assignor to Conrac Corporation, Stamford, Conn.

Filed Nov. 21, 1985, Ser. No. 800,455
Int. Cl.[4] H01J *29/52*
U.S. Cl. 315—383 **24 Claims**



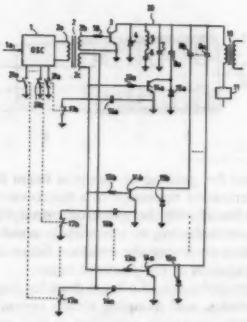
1. A system for stabilizing cathode emissions in a cathode ray tube comprising at least one video signal amplifier; means linked in series between the output of said at least one video signal amplifier and at least one cathode of said tube for interrupting the flow of a video signal to said tube during a test period; means for impressing a test signal of predetermined value on at least one of the cathodes of said tube; means for sampling the actual current of the test signal flowing to said at least one cathode in said tube, said sampling means being linked in parallel to said interrupting means; means for developing a differential signal representing the difference between the actual current flowing to said at least one cathode during a test period and a predetermined current to be flowing to said at least one cathode; and means for utilizing said differential signal to drive the actual current flowing to said at least one cathode to said predetermined desired value.

4,705,993

HORIZONTAL DEFLECTION CIRCUIT HAVING A VARIABLE RETRACE PERIOD

Shigeru Kashiwagi, Iwai, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Apr. 18, 1986, Ser. No. 853,406
Claims priority, application Japan, Apr. 19, 1985, 60-84331
Int. Cl.[4] H01J *29/70, 29/76*
U.S. Cl. 315—408 **13 Claims**



1. A horizontal deflection circuit for a cathode ray tube, comprising:

an oscillator responsive to a horizontal sync pulse applied thereto for generating a first oscillation at the frequency of the sync pulse;

a resonant circuit comprising a deflection coil and a first capacitor;

first switching means connected to said resonant circuit for generating a ramp current in said deflection coil in response to a first half cycle of said first oscillation and causing a second, half-cycle oscillation in said resonant circuit following a complete cycle of the first oscillation;

a second capacitor;

a manually controlled switch; and

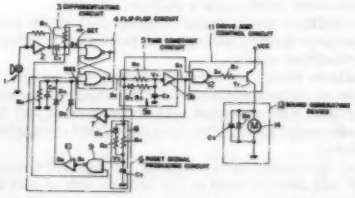
second switching means selectively enabled in response to operation of said manually controlled switch for intermittently coupling said second capacitor to said first capacitor in response to a second half cycle of said first oscillation.

4,705,994

ELECTRIC EQUIPMENT DRIVING CIRCUIT

Eishi Koike, Sagamihara, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Dec. 4, 1986, Ser. No. 937,681
Int. Cl.[4] A63H *30/04*
U.S. Cl. 318—16 **1 Claim**



1. An electric equipment driving circuit comprising:

a transducer for converting an input signal into an electric output signal;

a bistable circuit supplied with the output signal of said transducer as a set signal;

a time constant circuit connected to an output terminal of said bistable circuit for producing an output after a fixed time elapses from a time at which the output of said bistable circuit is caused to be an on condition;

A reset signal producing circuit supplied with the output of said time constant circuit, the output of said bistable circuit, and the output of said transducer, said reset signal producing circuit producing a reset signal for said bistable circuit when the output of said time constant circuit is obtained, and when both the output of said bistable circuit and the output of said transducer are in an on condition; and

a drive and control circuit supplied with the output of said bistable circuit for driving and controlling an electric motor in response to output from the bistable circuit.

4,705,995

CONTROL CIRCUIT FOR AIRLESS SPRAY GUN

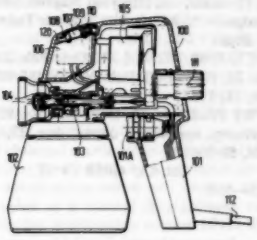
Hans-Joachim Boll, Markdorf, Fed. Rep. of Germany, assignor to Wagner International AG, Switzerland and J. Wagner GmbH, Fed. Rep. of Germany

Filed Aug. 29, 1986, Ser. No. 901,656

Claims priority, application European Pat. Off., Sep. 6, 1985, 85111308.4

Int. Cl.[4] H02K *33/00*

U.S. Cl. 318—129 **29 Claims**



1. An airless spray gun for spraying a material from a reservoir, comprising:

a pump piston for pumping material from the reservoir;

a drive arrangement having a coil and a swinging armature for driving said pump piston and an input for connection to an alternating current source;

an output connected to said coil;

a suppression circuit connected to said input to suppress an arbitrarily selectable whole number of successive half-waves of the alternating current source, said suppression circuit including a plurality of suppression stages to transmit corresponding ones of half-waves of the alternating current source in unaltered size and duration; and

a plurality of phase-angle control circuits corresponding in number to the number of said suppression stages, each of said phase-angle control circuits being connected to one of said suppression stages and effecting a phase-angle of a predetermined size for transmittal to said coil.

29. A control circuit for an airless spray gun having a pump in a housing for ejecting material drawn from a reservoir and a driver for driving the pump and including a swinging armature moved by a coil, comprising:

a frequency reduction circuit connectable to AC power for suppressing ones of the half-waves of the AC power, said frequency reduction circuit being variable to suppress selected numbers of successive half-waves, and

a phase-angle control circuit connected to receive ones of the half-waves not suppressed by said frequency reduction circuit, said phase-angle control circuit connected to delay the nonsuppressed half-waves from said frequency reduction circuit for transmittal to the coil of the pump driver, said delay corresponding to the selected number of successive half-waves suppressed by said frequency reduction circuit,

whereby selection of a frequency reduction and a corresponding phase-angle enables a reduced quantity of material to be ejected from the spray gun while retaining atomization of the ejected material.

4,705,996

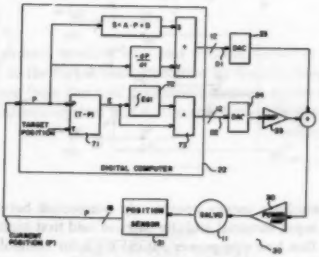
APPARATUS FOR POSITIONING A ROTATING ELEMENT

Robert P. Harshberger, Jr., San Jose; Bryan E. Loucks, Los Altos Hills, and Kenneth G. Witte, San Jose, all of Calif., assignors to Greyhawk Systems, Milpitas, Calif.

Continuation-in-part of Ser. No. 915,072, Oct. 3, 1986. This application Oct. 9, 1986, Ser. No. 916,909

Int. Cl.[4] G05B *1/06*

U.S. Cl. 318—160 **8 Claims**



1. Apparatus for positioning a rotatable element comprising:

means for rotating said element, including a restoring spring which resists the rotation of said element;

position sensing means for developing a position signal indicative of the position of said rotatable element shaft;

digital processing means for periodically performing the steps of

developing an error signal proportional to the difference between a specified target position and said position signal;

developing an integration signal by integrating said error signal;

developing a velocity signal by differentiating said position signal; and

developing a spring force compensation signal proportional to said position signal; and

means for applying rotational force to said rotatable element including

means for generating a first signal proportional to the sum of said integration signal and said error signal;

means for phase shifting said first signal;

means for generating a second signal proportional to the sum of said phase shifted signal, said spring force compensation signal, and said velocity signal; and

means for applying rotational a force to said rotatable element proportional to said second signal.

4,705,997

BIDIRECTIONAL MOTOR DRIVE CIRCUIT

David L. Juzswik, Dearborn Heights, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Feb. 21, 1986, Ser. No. 832,486

Int. Cl.[4] H02P *1/04*

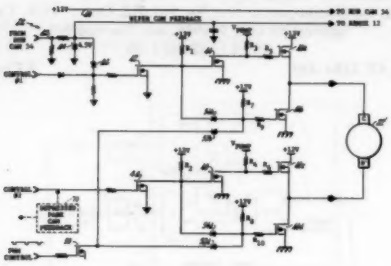
U.S. Cl. 318—341 **13 Claims**

1. Improved drive circuitry for a bidirectional inductive DC motor, the motor having first and second terminals for operative connection with a source of DC electrical power, said

drive circuitry being for connection in series with said motor terminals across the source of DC electrical power and comprising:

four power MOSFETS operatively connected to said motor terminals in H-bridge configuration across the power source, including first and second high-side power MOSFETS operatively connected to said first and said second motor terminals respectively and first and second low-side power MOSFETS operatively connected to said first and said second motor terminals respectively;

first and second input terminal means for receiving first and second control signals respectively, each said control signal being one of two logic states;



first switching means operatively connected between said first input terminal and the gates of said first high-side and said first low side power MOSFETS for controlling conduction of said first high-side and said first low-side power MOSFETS in substantially complementary fashion; and

second switching means operatively connected between said second input terminal and the gates of said second high-side and said second low-side power MOSFETS for controlling conduction of said second high-side and said second low-side power MOSFETS in substantially complementary fashion.

4,705,998

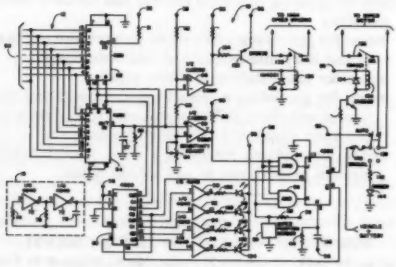
AUTOMATIC WINDOW WIPER CONTROL

Donald L. Millerd, San Diego, and Marl J. Bell, Valley Center, both of Calif., assignors to Steven Alpert, Encinitas, Calif., a part interest

Filed Feb. 9, 1987, Ser. No. 12,617

Int. Cl.[4] B60S *1/08*

U.S. Cl. 318—444 **14 Claims**



1. An automatic wiper motor control system for operating a window wiper motor which operates at least one wiper blade to and fro across window for removing moisture from the area which it sweeps, said motor having a park circuit means for returning said wiper blade to a home location when said wiper motor action is terminated at other than the wiper blade home location comprising:

a voltage source;

a moisture sensor, said moisture sensor comprising a plurality of spaced apart exposed conductive strips positioned within an area of the sweep of said at least one wiper blade;

a voltage storage means;

a scanning circuit for sequentially connecting adjacent pairs of said conductive strips, one of said pair to said voltage source and the other of said pair to said voltage storage means;

a wiper motor operating circuit;

a voltage sensing means connected between said voltage storage means and said wiper motor operating circuit, said voltage sensing means activates said wiper motor operating circuit when the voltage level of said voltage storage means exceeds a preselected voltage level; and

a wiper position sensor means positioned along the sweep of said wiper blade and influenced by the blade passing thereacross for activating the operation of said voltage sensing means, whereby a determination is made by said automotive wiper motor control system to operate said wiper motor or terminate said operation.

4,705,999

METHOD FOR CONTROLLING AN ARTICULATED ROBOT

Kazuo Soji, Hirakata, and Hiroyuki Nagano, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

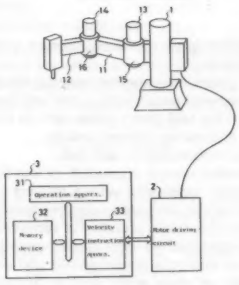
PCT No. PCT/JP85/00234, § 371 Date Feb. 21, 1986, § 102(e) Date Feb. 21, 1986, PCT Pub. No. WO85/05198, PCT Pub. Date Nov. 21, 1985

PCT Filed Apr. 25, 1985, Ser. No. 827,932

Claims priority, application Japan, Apr. 27, 1984, 59-86420; May 7, 1984, 59-90619

Int. Cl.[4] G05B *19/42*

U.S. Cl. 318—568 **4 Claims**



1. A method for controlling an articulated robot of the type which comprises a first arm supported rotatably from a main body via a first articulated joint, a second arm supported rotatably from said first arm via a second articulated joint, and respective first and second motors coupled to said first and second articulated joints for rotating said first arm and said second arm, each of said first and second motors having a respective predetermined upper torque limit, wherein the displacement of said first arm and said second arm to displace the remote end of said second arm from an initial position P_i to a subsequent position P_{i+1} is controlled by angular velocity instructions provided to said first and second motors to effect controlled acceleration and deceleration during displacement from the initial position P_i to the subsequent position P_{i+1}, said method comprising the steps of:

(a) storing a reference acceleration curve and a reference deceleration curve in a memory means by which velocity instruction values or desired displacement positional instruction values for said respective first and second motors are generated as a function of time or a displacement amount;

(b) reading in positional data for the initial position P_i and the subsequent position P_{i+1} to which the remote end of the second arm is to be displaced;

(c) varying an acceleration time or a displacement amount to obtain an acceleration value as a function of said stored reference curve information for acceleration of the remote end of said second arm from position P_i to position P_{i+1};

(d) calculating the torque load of said first motor and said second motor for acceleration of the remote end of said second arm from said initial position P_i to said subsequent position P_{i+1} for the obtained acceleration value;

(e) repeating said varying step (c) and calculating step (d) until the calculated torque load for each of said first and second motors is below its predetermined upper torque limit and the calculated torque load for at least one of said first and second motors if at a maximum value under its predetermined upper torque limit;

(f) varying a deceleration time or a displacement amount to obtain an deceleration value as a function of said stored reference curve information for deceleration of the remote end of said second arm from position P_i to position P_{i+1};

(g) calculating the torque load of said first motor and said second motor for deceleration of the remote end of said second arm from said initial position P_i to said subsequent position P_{i+1} for the obtained deceleration value;

(h) repeating said varying step (f) and calculating step (g) until the calculated torque load for each of said first and second motors is below its predetermined upper torque limit and the calculated torque load for at least one of said first and second motors is at a maximum value under its predetermined upper torque limit;

(i) using said obtained acceleration time or said displacement amount during acceleration as a reference for said stored reference acceleration curve and issuing a velocity instruction value or a desired displacement positional instruction for the acceleration portion of the displacement of the remote end of said second arm; and

(j) using said obtained deceleration time or said displacement amount during deceleration as a reference for said stored reference deceleration curve and issuing a velocity instruction value or desired displacement positional instruction for the deceleration portion of the displacement of the remote end of said second arm.

4,706,000

TOOL POSTURE CONTROL SYSTEM

Hajimu Kishi, Hino; Shinsuke Sakakibara, Komae; Haruyuki Ishikawa, Tokyo, and Yuuichi Kanda, Hino, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP85/00462, § 371 Date Apr. 24, 1986, § 102(e) Date Apr. 24, 1986, PCT Pub. No. WO86/01617, PCT Pub. Date Mar. 13, 1986

PCT Filed Aug. 21, 1985, Ser. No. 860,192

Claims priority, application Japan, Aug. 24, 1984, 59-175154

Int. Cl.[4] G05B *19/42*

U.S. Cl. 318—568 **3 Claims**

1. A tool posture control system, comprising:

a robot having an arm;

a tool mounted on the distal end of the arm;

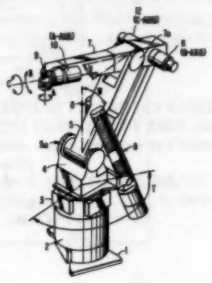
principal vector setting means for determining a position of the robot in a robot coordinate system;

means for determining a tool vector indicative of the present position of the tool in a tool coordinate system;

means for determining a target tool vector inclined with respect to a principal vector in a searching coordinate system;

rotating means for rotating the tool vector indicative of the present position of the tool to the target tool vector through vector rotation; and

means for generating data for driving the axes of the robot from data produced by rotating the tool vector indicating



the present position with said rotating means to move the tool to the target vector position by transforming the tool vector from the tool coordinate system, to the searching coordinate system and to the robot coordinate system.

4,706,001

INDUSTRIAL ROBOT

Seiichiro Nakashima; Kenichi Toyoda, both of Hino, and Nobutoshi Torii, Hachioji, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP85/00378, § 371 Date Mar. 3, 1986, § 102(e) Date Mar. 3, 1986, PCT Pub. No. WO86/00558, PCT Pub. Date Jan. 30, 1986

PCT Filed Jul. 4, 1985, Ser. No. 845,276

Claims priority, application Japan, Jul. 4, 1984, 59-137293

Int. Cl.[4] G05B *19/10*

U.S. Cl. 318—568 **6 Claims**

1. An industrial robot for use in an atmosphere containing an inflammable or explosive gas, comprising:

a robot assembly including a stationary robot component and a plurality of movable robot components, at least a part of said stationary robot component and said movable robot components having therein airtight chambers which communicate with each other;

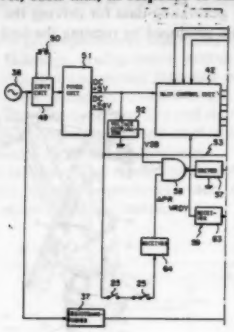
means for supplying pressurized air to said airtight chambers to maintain the interior of said airtight chambers at a pressure higher than a predetermined pressure level, which is higher than that of the external atmosphere to prevent seepage of said inflammable or explosive gas into said airtight chambers;

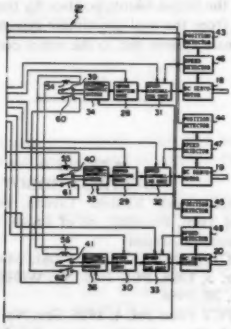
electric motors for driving and moving said movable robot components, said motors disposed within said airtight chambers;

a programmable controller for supplying electric power to said motors and for controlling said motors in accordance with a predetermined program, said controller disposed outside of said atmosphere of inflammable or explosive gas and electrically connected to said motors through electric cables arranged in said airtight chambers and hermetically sealed conduit connected to said stationary robot component; and;

a plurality of pressure switches, arranged in said airtight chambers and electrically connected to said controller, for detecting a pressure in said airtight chambers and transmitting a motor-stop signal to said controller when the

pressure in said airtight chambers drops below said predetermined level, such that, in response to said motor-stop





signal from said pressure switches, said controller stops the supply of electric power to said motors.

4,706,002

NUMERICAL CONTROL UNIT

Hiroomi Fukuyama, Hachioji, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP82/00332, § 371 Date Apr. 21, 1983, § 102(e) Date Apr. 21, 1983, PCT Pub. No. WO83/00754, PCT Pub. Date Mar. 3, 1983

Continuation of Ser. No. 491,200, Apr. 21, 1983, abandoned.

This PCT application Aug. 24, 1982, Ser. No. 862,200

Claims priority, application Japan, Aug. 24, 1981, 56-132434

Int. Cl.[4] G05B *19/10*

U.S. Cl. 318—568 **7 Claims**

1. A manual numerical control unit operatively connected to an industrial machine and operatively connectable to an external unit for storing a machining program, comprising:

a program creating device including:

input means for entering data for the creation of a machining program;

a first processor, operatively connected to said input means, for creating a machining program in accordance with the entered data; and

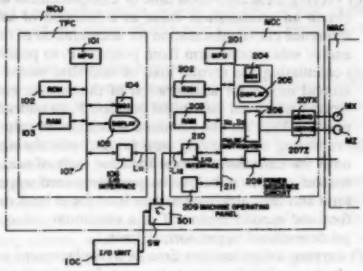
a first memory, operatively connected to said first processor, for storing the created machining program;

a machine control device including:

a second memory, operatively connectable to said first memory, for storing a machining program transferred from said first memory; and

a second processor, operatively connected to said second memory, for executing the machining program stored in said second memory to numerically control the industrial machine; and

a switching circuit, operatively connected to said program creating device and said machine control device, and having a connector for coupling to the external unit, for selectively coupling the external unit to said program



creating device or to said machine control device, and for selectively connecting said first and second memories to transfer the machining program from said program creating device to said machine control device, said switching circuit being disconnected when said program creating device is to perform machining program creation concurrently with said machine control device numerically controlling the industrial machine.

4,706,003

ACCELERATION AND DECELERATION CONTROL SYSTEM

Seiichiro Nakashima; Kenichi Toyoda, both of Hino, and Shinsuke Sakakibara, Komae, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

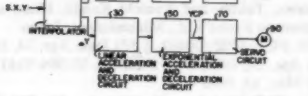
PCT No. PCT/JP85/00377, § 371 Date Mar. 4, 1986, § 102(e) Date Mar. 4, 1986, PCT Pub. No. WO86/00730, PCT Pub. Date Jan. 30, 1986

PCT Filed Jul. 4, 1985, Ser. No. 843,694

Claims priority, application Japan, Jul. 4, 1984, 59-138270

Int. Cl.[4] G05B *19/42*

U.S. Cl. 318—568 **4 Claims**



1. An acceleration and deceleration system for progressively increasing a feed speed up to a command speed and for progressively reducing the feed speed, comprising:

a linear acceleration and deceleration circuit operatively connected to receive input data representing a feed speed and a displacement, for effecting a linear acceleration and deceleration computation on the input data to produce an output signal; and

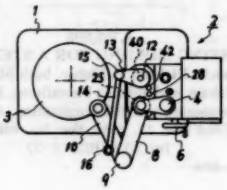
an exponential acceleration and deceleration circuit, operatively connected to receive the output signal from said linear acceleration and deceleration circuit, for effecting an exponential acceleration and deceleration computation on the output signal to produce a speed command signal.

4,706,004

PLAYBACK SYSTEM GRINDING ROBOT

Isamu Komatsu, Sagamihara, and Kenkichi Serizawa, Yamato, both of Japan, assignors to Aida Engineering, Ltd., Sagamihara, Japan

Filed Dec. 4, 1984, Ser. No. 678,152
Claims priority, application Japan, Dec. 10, 1983, 58-233332; Dec. 19, 1983, 58-239329; Apr. 20, 1984, 59-79715
Int. Cl.[4] G05B 19/10
U.S. Cl. 318—568 3 Claims



1. A playback system grinding robot for controlling the movement of an abrasive tool in a horizontal plane and for grinding the surface of a workpiece to be ground, and having a dual degree-of-freedom of control in a polar coordinate system, comprising in combination:

a support means including a main vertical rotary axis and a secondary vertical axis;

a first arm having a first end and a second end, said first arm being supported rotatably about said main axis at said first end by said support means; said first arm having a head at said second end;

a second arm having a first end and a second end, said second arm being pivotably attached to said head of said first arm at said first end of said second arm; said second arm being pivotable about a vertical axis;

a third arm having a first end thereof connected for rotation with a revolution shaft, and a linkage means connected between an intermediate portion of said second arm and a second end of said third arm, for driving said second arm;

said revolution shaft about which said third arm rotates having an axis of rotation which is vertically disposed, said revolution shaft being disposed adjacent to and having its axis parallel with said main vertical rotary axis;

said second end of said second arm having a head; said head of said second arm having a vertical axis;

an abrasive tool connected to said head axis of said second arm so as to be freely turnable to different directions;

a holder mounted rotatably and vertically movably at said head end of said second arm and projecting downwardly for a predetermined length from a lower surface of said second arm, said holder having said abrasive tool fixed thereto at a lower end of said holder;

an air cylinder disposed on an upper surface of said head end of said second arm and biasing said holder downwardly by a piston rod;

a first servomotor for turning said first arm around said main axis;

a second servomotor for rotating said revolution shaft and turning said second arm;

a positional data generating means for generating positional data indicating a horizontal movement position of said abrasive tool;

a memory means for storing said positional data;

said positional data generating means including a first rotary encoder for detecting a turning angle of said first arm and a second rotary encoder for detecting a rotating angle of said revolution shaft;

whereby a direct teaching to said memory means occurs by manually moving said holder attached with said abrasive tool along the locus to be travelled, on the surface of the workpiece, thereby taking in angle pulses from said first and second rotary encoders and sequentially counting and storing the positional data of the abrasive tool on the horizontal plane;

a playback means for playing back said positional data to control movement of said abrasive tool;

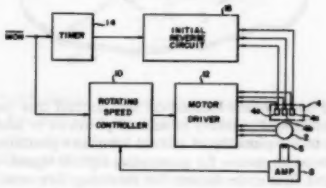
and a robot control circuit for generating the angle pulses corresponding to said positional data so as to drive said first and second servomotors and conducting an automatic playback grinding operation on the taught locus.

4,706,005

CONTROL CIRCUIT OF DIRECT CURRENT SERVOMOTOR FOR FLOPPY DISK DRIVE

Akinobu Iwako, Saitama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1986, Ser. No. 848,713
Claims priority, application Japan, Apr. 9, 1985, 60-074876
Int. Cl.[4] H02P 6/02
U.S. Cl. 318—603 2 Claims



1. A control circuit of a direct current servomotor for a floppy disk drive which includes a spindle motor having a stator and rotor to rotate a floppy disk, a plurality of magnet pole position detectors fixed on the stator for detecting a magnet pole position of the rotor in order to selectively change over the stator coil exciting phases of said spindle motor, an FG coil generating a frequency signal in proportion to the rotor rotating speed of said spindle motor, a rotating speed controller and a motor driver controlling said spindle motor at a fixed rotating speed with the basis of the rotating speed detecting signal supplied from said FG coil, improvement of which comprising:

a timer outputting timer signal by means of counting a predetermined certain time set up with said timer after application of motor start-up signal, said time being established longer than the time when a drive pin connected with a motor shaft of said spindle motor moves onto the rear end of a drive hole of the floppy disk; and

an initial reverse circuit inverting the detecting direction of said magnet pole position detectors for the predetermined time after the motor start-up,

whereby said spindle motor can be drive to rotate to the reverse direction for the predetermined time after the motor start-up.

4,706,006

DUAL-AXIS TACTILE FEEDBACK LIGHT CONTROL DEVICE

Dennis Solomon, Yarmouth Port, Mass., assignor to Altman Stage Lighting Co., Inc., Yonkers, N.Y.

Filed Oct. 31, 1986, Ser. No. 925,165
Int. Cl.[4] G05B 1/06
U.S. Cl. 318—640 22 Claims

1. A light control system for a luminaire rotatably movable over a first rotational distance to a plurality of first luminaire positions about a Y-axis by a pan motor and over a second rotational distance to a plurality of second luminaire positions about an X-axis by a tilt motor, comprising, in combination:

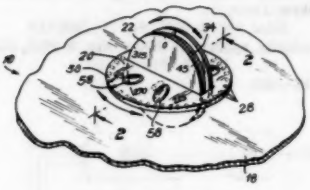
a support structure,

first disk means aligned with a first plane and having a first

axis, said first disk means being rotatably mounted to said support structure for a first circular movement to a plurality of selected first positions about said first axis,

second disk means aligned with a second plane approximately perpendicular to said first plane and having a second axis aligned approximately perpendicular to said first axis and with said first plane, said second disk being rotatably mounted to said first disk for a second circular movement to a plurality of selected second positions about said second axis,

first code means associated with said first disk means for indexing said plurality of first positions of said first disk to the plurality of first luminaire positions,



second code means located on said second disk means for indexing said plurality of second positions of said second disk to the plurality of second luminaire positions,

first encoding means for generating optical signals directed at said first code means, for receiving first code signals reflected from said first code means, and for directing said first code signals to activate said tilt motor for rotation of said luminaire to a selected first luminaire position, and

second encoding means for generating optical signals directed at said second code means, for receiving second code signals reflected from said second code means, and for directing said second code signals to activate said pan motor for rotation of said luminaire to a selected second luminaire position.

4,706,007

SURFACE PULSE MOTOR

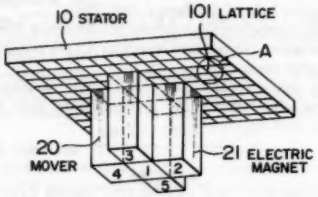
Nagahiko Nagasaka, Iruma, Japan, assignor to Kabushiki Kaisha Yaskawa Denki Seisakusho, Fukuoka, Japan

Filed May 27, 1986, Ser. No. 866,639

Claims priority, application Japan, Jun. 25, 1985, 60-137018

Int. Cl.[4] G05B *11/00*

U.S. Cl. 318—687 **2 Claims**



1. A surface pulse motor having a stator and a mover, wherein

said stator comprises a magnetic material in a planar configuration, said stator having a number of projections spaced apart by a given pitch on a surface thereof at positions defining a rectangular lattice,

said mover comprises five phase electromagnets of a densely wound type,

said electromagnets have a number of projections spaced apart by said given pitch on a surface thereof opposing the surface of said stator,

said projections of said mover define a rectangular coordinate lattice (X, Y) which is rotated relative to said rectangular lattice of said stator by an angle $\tan^{-1}(\frac{1}{2})$,

said electromagnets of the second phase through the fifth phase are spaced apart from those of the first phase by a distance equal to $1/\sqrt{5}$ of the pitch of said rectangular lattice of said stator in the directions $+X$, $+Y$, $-X$ and $-Y$ of said coordinate lattice, respectively, and

means are provided for supporting said mover such that an air gap is maintained between said stator and said mover and that said electromagnets are movable simultaneously in said X and Y directions.

4,706,008

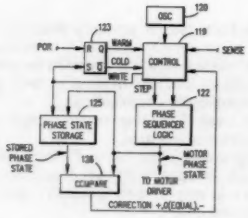
SELF-ADJUSTING HOMING FOR A STEPPING MOTOR

Darell D. Cronch; Richard T. Fisher, both of Georgetown; Patricia A. Graham, and John E. Passafiume, both of Lexington, all of Ky., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 11, 1986, Ser. No. 940,329

Int. Cl.[4] H02P *8/00*

U.S. Cl. 318—696 **9 Claims**



1. A positioning device comprising:

a step motor;

position sensor means coupled to said step motor to generate a position signal when said step motor is at a predetermined location;

read/write memory means for storing data defining a phase state of said step motor;

means for determining availability of previously written phase state data in said read/write memory means; and

correction means for driving said step motor to bring an actual phase state of said step motor into correspondence with said stored data.

4,706,009

ELECTRONIC SWITCHING POWER SUPPLY

Gerhard Schwarz, Altena, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Taunus, Fed. Rep. of Germany

Filed Dec. 15, 1986, Ser. No. 941,920

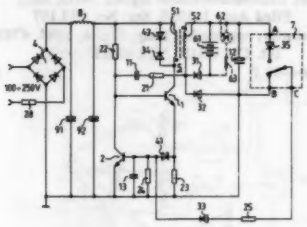
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1985, 3545324

Int. Cl.[4] H02J *7/00*

U.S. Cl. 320—22 **8 Claims**

1. An electronic switching power supply for charging a storage battery or accumulator (61) from an AC or DC voltage source of different voltage levels, including a primary-pulsed blocking oscillator type converter in which the primary coil (51) of a transformer (5) is connected in series with a first transistor (1) while its secondary coil (52) is connected in series with the storage battery (61) and a first diode (31), with the base of the first transistor (1) being connected, via a first capacitor (11) and a first resistor (21) connected in series, both to the one end of the secondary coil (52) of the transformer (5), while the other coil end is connected to the storage battery (61), and, via a second resistor (22), to the one terminal of the input voltage source and to the collector of a second transistor (2) having its emitter connected to reference potential, with the

emitter of the first transistor (1) being connected both to reference potential via a third resistor (23) and, via a zener diode (41), to the base of the second transistor (2) connected to reference potential via a fourth resistor (24), characterized in that a second capacitor (12) in series with a rectifier (32) are provided in parallel with the secondary coil (52) of the transformer (5), their junction being connected to reference potential, and in that a switching arrangement (7) is provided in parallel with the second capacitor (12), said switching arrangement connecting either the terminal (A) of the second capacitor (12) connected to the secondary coil (52) of the transformer or the terminal (B) of the second capacitor (12) connected to reference potential with the base of the second transistor (2) via a decoupling arrangement.

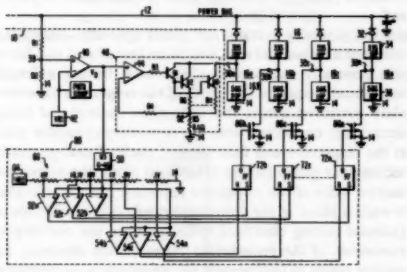


4,706,010

LINEAR SOLAR ARRAY VOLTAGE CONTROL SYSTEM

Patrick J. Callen; John D. Bingley, both of Yardley, Pa., and Richard A. Newell, Fair Haven, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Sep. 10, 1986, Ser. No. 905,513
Int. Cl.[4] H02J 7/00; G05F 1/46
U.S. Cl. 323—225 **6 Claims**



1. In a solar cell power bus arrangement including a power bus, a return bus and a plurality of N solar cell arrays arranged in parallel between the power bus and return bus, a voltage regulator for maintaining a desired voltage between the power bus and return bus, comprising in combination:

digital means including N−1 shunt switches connected respectively between N−1 of said arrays and said return bus, a switch, when switched on, fully shunting at least a portion of its associated array; and

linear shunt means coupled between the remaining one of said N arrays and said return bus for measuring the current passing through said remaining array, said linear shunt also coupled to said digital means; and

said digital means including means responsive to the level of said current for switching on or off various ones of the shunt switches connected to said N−1 arrays,

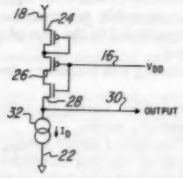
said linear shunt linearly shunting said remaining array in an amount to maintain the desired voltage between said power bus and return bus.

4,706,011

HIGH VOLTAGE PULSE DETECTOR WITH CONTROLLABLE CURRENT CONSUMPTION

Sossio Vergara, Frattamaggiore, Italy; Sebastiano D'Arrigo, Houston, Tex., and Giuliano Imondi, Rieti, Italy, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 7, 1986, Ser. No. 882,557
Int. Cl.[4] G05F 1/565
U.S. Cl. 323—274 **6 Claims**



1. A CMOS circuit for sensing a voltage present on an input line and for providing an output signal on an output line thereof when the voltage on the input line exceeds a limit voltage V_{DD}, comprising:

an isolation P-channel MOS field effect transistor having a source-to-drain path coupled between the input and output lines for isolating the input and output lines when the input voltage is less than V_{DD} and a gate coupled to a limit voltage source;

a threshold adjustment MOS transistor connected as a diode in series with said isolation transistor between the input and output lines; and

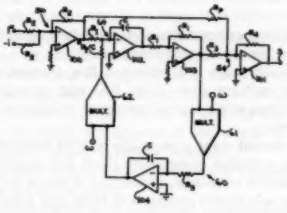
a constant current source coupled from the output line to ground.

4,706,012

FREQUENCY COMPENSATED REGULATOR

Russel J. Kerkman, and Timothy M. Rowan, both of Milwaukee, Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 735,659, May 20, 1985. This application May 14, 1986, Ser. No. 863,015
Int. Cl.[4] H02P 5/40; G05F 1/44
U.S. Cl. 323—280 **5 Claims**



1. In a control system which receives a sinusoidal reference input signal (i*) and produces an output which is indicated by a sinusoidal feedback signal (i), a regulator for receiving the sinusoidal reference input signal and feedback signal and producing a control signal which comprises:

first summing means for receiving at one input said sinusoidal reference input signal (i*) and receiving at a second input said sinusoidal feedback signal (i), the first summing means being operable to produce an error signal which is

indicative of the difference between the sinusoidal reference input signal and the sinusoidal feedback signal;

second summing means for receiving at one input a signal proportional to said error signal and for receiving at a second input a frequency dependent signal, the second summing means being operable to produce a summed signal which is proportional to the sum of the signals applied to its two inputs;

a first integrator having an input connected to receive the summed signal from the second summing means and being operable to produce an integrator output signal which is the integral of the summed signal applied to its input;

third summing means for receiving at one input the integrator output signal and for receiving at a second input a signal proportional to said error signal, the third summing means being operable to produce said control signal which is proportional to the sum of the signals applied to its inputs; and

means for producing said frequency dependent signal which includes:

(a) a first multiplier having its output connected to the second summing means,

(b) a second integrator circuit having its output connected to one input on the first multiplier,

(c) a second multiplier having one input connected to the output of the first integrator and an output connected to the input of the second integrator, and

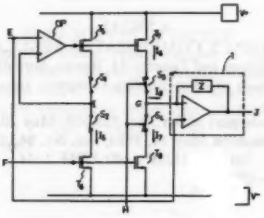
(d) means for coupling to a second input on each of the multipliers a signal which is proportional in magnitude to the frequency of said sinusoidal reference input signal.

4,706,013

MATCHING CURRENT SOURCE

Tai-Haur Kuo, Tainan Hsien, Taiwan, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Nov. 20, 1986, Ser. No. 932,933
Int. Cl.[4] G05F *3/20*
U.S. Cl. 323—316 **12 Claims**



1. A matching current source circuit for providing equivalent sink and source current comprising:

a first circuit stage comprising a first transistor, a set of dummy switches comprising first and second constantly on switches, and a second transistor, connected in series in that order;

a second circuit stage comprising a third transistor, a set of current switches comprising third and fourth switches, and a fourth transistor, connected in series in that order;

means for selectively setting said third and fourth switches to have a first state with the third switch on and the fourth switch off, and a second state with the third switch off and the fourth switch on;

an operational amplifier having its output coupled to the input electrodes of the first and third transistors;

the noninverting input of the operational amplifier being coupled to the junction between the first and second switches and its inverting input being connected to have the same voltage as the junction point between third and fourth switch;

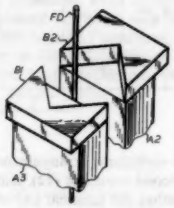
whereby, depending on the first or second states of said third and fourth switch, the matching current source provides a current sink or source.

4,706,014

CAPACITIVE DEVICES FOR MEASURING THE DIAMETER OF A DIELECTRIC FIBER

Bruno Fabbri, Turin, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Aug. 2, 1985, Ser. No. 762,157
Claims priority, application Italy, Sep. 6, 1984, 67878 A/84
Int. Cl.[4] G01B *7/08*; G01R *27/26*
U.S. Cl. 324—61 P **5 Claims**



1. In a device for the capacitive measurement of the diameter of a dielectric fiber in which capacitance variations due to changes in dielectric properties of a space between plates of a capacitor caused by the introduction of said fiber into said space are measured, the improvement wherein said capacitor comprises:

a pair of mutually parallel capacitor plates of rectangular cross section having spacedly juxtaposed confronting longitudinal wide sides straddling said fiber, rear wide sides parallel to said confronting wide sides, lateral narrow sides perpendicular to said wide sides of each capacitor plate, and respective rectangular end faces lying in a common plane at one end of each of said capacitor plates; and

a pair of generally rectangular plates spacedly juxtaposed with one another and each seated on one of said end faces, said generally rectangular plates each having a length substantially equal to the width of the respective capacitor plate measured across the wide sides thereof and being electrically connected with the respective capacitor plate at the respective end face thereof, each of said generally rectangular plates having extensions along the respective narrow sides of the respective capacitor plate converging toward a plane of the respective confronting wide side to generate strong electrical fields between the converging extensions of the rectangular plates on the opposing capacitor plates to compensate for variations in an electrical field between said capacitor plates caused by vibration of said fiber.

4,706,015

METHOD AND CIRCUIT FOR REDUCING CONTACT RESISTANCE OF THE POTENTIAL PROBES OF A FOUR-POINT-PROBE IN CONTACT WITH A III-V COMPOUND SEMICONDUCTOR WAFER

James T. C. Chen, 1526 Cherrywood Dr., San Mateo, Calif. 94403

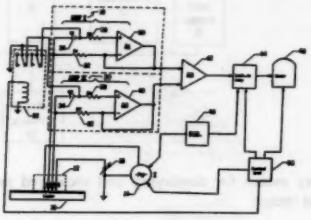
Filed Jan. 9, 1986, Ser. No. 817,460
Int. Cl.[4] G01R *27/14*
U.S. Cl. 324—64 **14 Claims**

8. A circuit for measuring the resistivity of a wafer of a III-V compound semiconductor, the circuit comprising:

four-point probe means having first, second, third and fourth probes spaced apart from each other, each of said four

probes being disposed to make physical and electrical contact with said wafer;

source means for applying a composite DC and low frequency AC signal between the first and fourth probes wherein the magnitude of the DC signal component is at least one half of the peak-to-peak magnitude of the AC signal component plus selected DC level to apply a DC bias to the wafer when contact is made;



high input impedance means for rejecting the DC potential component and isolating the AC potential component of the composite DC/AC signal applied to the wafer at each of the second and third probes to reduce the resistance between each of said second and third probes and their respective contact point on the wafer; and

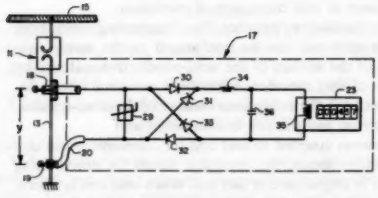
comparing means for comparing the AC potential components isolated by the high input impedance means to form an AC difference signal therefrom that is proportional to the resistivity of the wafer.

4,706,016

SURGE DETECTOR HAVING DISTRIBUTED LINE INDUCTANCE PICKUP

Edmund O. Schweitzer, Jr., 2433 Center St., Northbrook, Ill. 60062

Filed May 3, 1985, Ser. No. 730,752
Int. Cl.[4] G01R *19/00*; H02H *3/22*
U.S. Cl. 324—102 **18 Claims**



8. A surge detector for detecting the occurrence of a surge current in a monitored conductor having a distributed inductance along the length thereof and subject to the occurrence of a surge current therein, said detector comprising:

first connection means for establishing at a first predetermined location along the monitored conductor a first electrical connection;

second connection means for establishing at a second predetermined location along the monitored conductor a second electrical connection;

said first and second predetermined locations being axially spaced along said monitored conductor whereby upon occurrence of the surface current in the conductor an inductive-reactive sensing voltage is developed between said locations as a consequence of the distributed inductance therebetween;

charge storage means comprising a capacitor;

rectifier means comprising a rectifier network having first and second input terminals and first and second outupt terminals;

said first and second input terminals being connected to said first and second connection means, respectively, and said first and second output terminals being connected to respective terminals of said capacitor to provide a capacitively reactive shunt between said locations relative to the surge current whereby a charge is developed in said capacitor upon occurrence of the surge; and

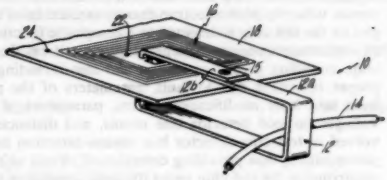
indicator means connected across said capacitor and operable from the charge developed therein for producing an output indicative of the occurrence of the surge current.

4,706,017

ELECTRICAL CURRENT SENSOR

Larry E. Wilson, Marion, Ind., assignor to Hamilton Standard Controls, Inc., Farmington, Conn.

Filed Aug. 5, 1985, Ser. No. 762,475
Int. Cl.[4] H01F *40/06*
U.S. Cl. 324—127 **5 Claims**



1. For sensing the current in a conductor intended to carry an laternating electrical current, an improved current sensor of the type including a substantially annular coil assembly having a pair of output terminals and having closed-loop flux concentrating means extending through the coil, the flux concentrating means being adapted to be in justaposition with the current-carrying conductor, and wherein an emf representative of the current in the conductor appears at the output terminals of the coil assembly, the improvement wherein:

said coil assembly is substantially planar and is printed on the surface of a circuit board;

said flux concentrator is of one-piece construction and extends through said planar coil assembly and said circuit board, said flux concentrator including a pair of oppositely-extending leg portions disposed in adjacent overlapping relation, said flux concentrator being secured to said circuit board by fastening means acting between said overlapping leg portions of said flux concentrator and said circuit board; and

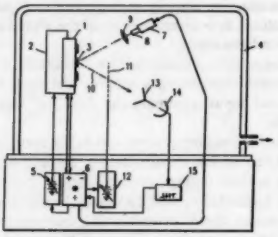
including circuit means connected to the output terminals of said planar coil assembly for at least amplifying the emf appearing thereat.

4,706,018

NONCONTACT DYNAMIC TESTER FOR INTEGRATED CIRCUITS

Johannes G. Beha, Wädenswil, Switzerland; Russell W. Dreyfus, Mt. Kisco, and Gary W. Rubloff, Katonah, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 1, 1984, Ser. No. 667,506
Int. Cl.[4] G01R *31/02, 19/00*
U.S. Cl. 324—158 R **11 Claims**



7. A system for dynamic testing of integrated circuit process intermediates characterized by:

(a) mounting means **2**, including a vacuum chamber **4** with a test chip site for mounting a test chip **1**, both electronically exercisable and accessible by radiation;

(b) laser means **7**;

(c) laser modification means **8**, operating with said laser means to provide a sharply focussed, very short duration pulse of controlled wavelength and at a controlled elevated photon energy to selected positions on a test chip mounted in said test chip site;

(d) detector bias means **11,12** juxtaposed to said mounting means **2** adjacent said test chip site; and

(e) detection means **13,14** juxtaposed to said mounting means adjacent said test chip site, outboard of said detector bias means; whereby photoelectron energy emitted from a test pad on the test chip is detected as a composite function of an instantaneous input voltage as processed on the test chip, including proper operation and also including improper operation due to fault, parameters of the pulse from said laser modification means, parameters of bias voltages on said detector bias means, and distances involved in test chip-detector bias means-detection means juxtaposition, thus providing detection of circuit voltages occurring on the test chip under dynamic conditions simulating actual or stressed operation.

4,706,019

ELECTRON BEAM TEST PROBE SYSTEM FOR ANALYZING INTEGRATED CIRCUITS

Neil Richardson, Mountain View, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

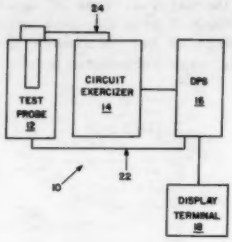
Filed Nov. 15, 1985, Ser. No. 798,592
Int. Cl.[4] G01R *31/28;* **H01J** *37/26*
U.S. Cl. 324—158 R **19 Claims**

1. An electron beam test probe system for analyzing an integrated circuit said analysis including the measurement of the potential at selected points on said integrated circuit, said electron beam test probe system comprising:

means for generating a test signal pattern and for coupling said test signal pattern to said integrated circuit;

point specifying means for specifying a point on said integrated circuit, said point specifying means including means for inputting and storing a layout diagram of said integrated circuit in a layout format consistent with that used by a mask design program and means for manually specifying a location on said integrated circuit with reference to said layout diagram;

electron beam test probe means for measuring said potential on said integrated circuit at said specified point and for generating an image of the surface of said integrated circuit in a region surrounding said specified point; and



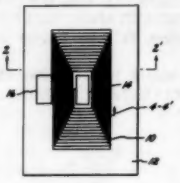
display means for displaying said measured potential and said image.

4,706,020

HIGH FREQUENCY EDDY CURRENT PROBE WITH PLANAR, SPIRAL-LIKE COIL ON FLEXIBLE SUBSTRATE FOR DETECTING FLAWS IN SEMI-CONDUCTIVE MATERIAL

John R. M. Viertl, and Mederic E. Auger, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 560,214, Dec. 12, 1983, Pat. No. 4,593,245.
This application Nov. 20, 1985, Ser. No. 800,006
Int. Cl.[4] G01N *27/90;* **G01R** *33/12*
U.S. Cl. 324—238 **1 Claim**



1. Apparatus for detecting a flaw in the surface and/or sub-surface region of a semi-conductive material, the surface including at least in part a non-planar portion, comprising:

a substantially planar, spiral-like, unilaminar copper coil having a wire diameter no greater than 2 mils adapted to be connected to an excitation signal source, said excitation signal source providing an excitation signal having a frequency equal to or greater than 7 megahertz, for generating a substantially uniform electromagnetic field extending normal to said coil when said coil is appropriately stimulated by said excitation signal source, the turns of said coil having sufficient spacing to minimize interwire capacitance at said frequency of excitation;

a flexible insulative member for supporting said coil, wherein said coil can be conformed to the non-planar portion of the surface of the semi-conductive material by flexture of said member, whereby a constant liftoff distance between the non-planar surface of the semi-conductive material and the coil is obtainable; and

terminal means coupled to said coil for connecting said coil to detection means, the detection means for determining changes in impedance in said coil when said coil is operationally disposed in relation to the surface and/or sub-surface region of the semi-conductive material and appropriately stimulated to generate the electromagnetic field.

4,706,021

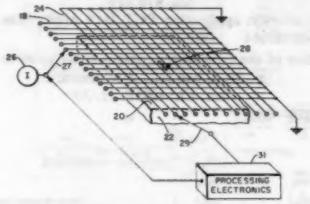
CROSSED WIRE DEFECT DETECTOR EMPLOYING EDDY CURRENTS

Jacques R. Chamuel, Framingham, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 521,311, Aug. 8, 1983, abandoned. This application Feb. 29, 1984, Ser. No. 583,490

Int. Cl.[4] G01N *27/82*; G01R *33/12*

U.S. Cl. 324—242 **18 Claims**



1. Apparatus for detection of defects in a workpiece having a surface of conductive material comprising:

at least one energization wire diposed parallel to a path along a first contour of said workpiece surface and having an operative length, each of said at least one energization wires adapted to be disposed adjacent to and substantially equidistant from said workpiece surface along said operative length;

at least one detection wire disposed parallel to a path along a second contour of said workpiece surface and having an operative length, each of said at least one detection wires adapted to be disposed adjacent to and substantially equidistant from said workpiece surface along said operative length, at least one of said detection wires intersecting at least one of said energization wires at a selected angle along the respective operative length thereof;

at least one of said at least one energization wire and said at least one detection wire comprising plural, spaced apart wires whereby a plurality of spaced apart intersections exist between detection and energization wires;

means operative to selectively induce a current in each of said energization wires to induce an eddy current along a path in the surface of the workpiece opposite in direction to the current in the respective energization wire;

the presence of a defect in the workpiece surface along the path of said eddy current producing a transverse eddy current which couples to an intersecting detection wire;

means operative to selectively sense, as a function of each of said plural intersections, the presence of a current in at least one of said detection wires and to produce a first signal representative of the selected detection wire current; and

means operative to electronically process the first signal to produce an output signal representative of a surface defect proximate the intersection of the respectively selected energization and detection wires.

4,706,022

ROTATING-PROBE DEFECT DETECTING DEVICE

Yasuichi Kudo, Kobe, Japan, assignor to Sanyo Special Steel, Hyogo, Japan

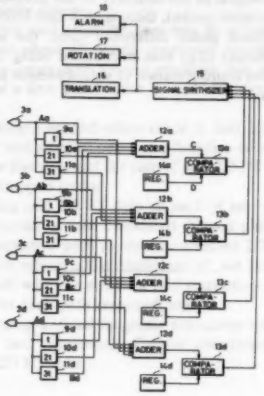
Filed Mar. 15, 1985, Ser. No. 712,152

Claims priority, application Japan, Mar. 29, 1984, 59-62437

Int. Cl.[4] G01N *27/72*

U.S. Cl. 324—243 **2 Claims**

1. A rotating-probe defect detecting device for inspecting an elongated test object moving longitudinally comprising a plurality of test probes arranged around and facing said object at equal intervals and in a plane orthogonal to a central axis of said object, a structure for supporting said probes to rotate about said central axis; delay means for delaying output signals of said probes to obtain time coincidence signals, corresponding to a same angular position about said central axis; adder circuit means for summing said time coincidence signals and providing summing signals; judge circuit means for detecting



presence of defects in said object from said summing signals and providing defect indicative signals; and means for synthesizing output signals of said judge circuit means in order to provide an amplified defect signal.

4,706,023

METHOD OF REDUCING ARTEFACTS IN IMAGES FORMED BY MEANS OF FOURIER ZEUGMATOGRAPHY

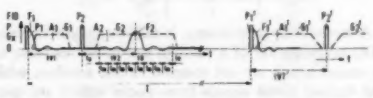
Johannes H. Den Boef, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 23, 1986, Ser. No. 821,652

Claims priority, application Netherlands, May 22, 1985, 8501459

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **18 Claims**



1. A method of determining a nuclear magnetic resonance distribution in a region of a body which is situated in a generated, steady, uniform magnetic field, including the steps of

(a) generating a high-frequency electromagnetic pulse in order to cause a precessional motion of the magnetization of nuclei in the body, thus generating a resonance signal,

(b) then applying at least one gradient magnetic field during a preparation period,

(c) then taking a first number of signal samples of the resonance signal during a measurement period,

(d) then repeating a measurement cycle comprising the steps (a), (b) and (c) for a second number of repetitions, the integral of the intensity of at least one gradient field over the preparation period having a different value at each repetition in order to provide a set of signal samples in a matrix consisting of (m) rows and (n) columns, per measurement cycle there being filled at least one row, from which, after Fourier transformation thereof, an image of the distribution of the induced nuclear magnetization is determined, characterized in that during a plurality of

measurement cycles the steady, uniform magnetic field is amplitude modulated, such that between the resonance signals associated with the various rows in the matrix which succeed one another with respect to the value of the integral of the intensity of the gradient field over the preparation period, there is each time introduced the same additional phase difference ($\Delta\phi$), the additional phase differences ($\Delta\phi$) thus introduced being cancelled before Fourier transformation of values present in columns of the matrix.

4,706,024

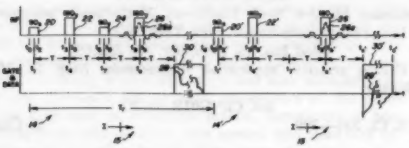
SUPPRESSION OF NON-COUPLED SPINS IN NMR IMAGING AND SPECTROSCOPY

Charles L. Dumoulin, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 5, 1986, Ser. No. 859,528

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **20 Claims**



1. A method for suppressing, in nuclear magnetic resonance (NMR) investigation of a sample, undesired response signals from nuclei which are not coupled to one another, while obtained desired NMR signals from nuclei which are spin-coupled to one another, comprising the steps of:

(a) evoking each of respective first and second NMR response signals from the sample responsive to respective first and second excitation signal sequences;

(b) preceding each of the first and second NMR excitation signal sequences with a different one of an alternating pair of signal subsequences predeterminedly selected for causing each of the excitation sequences to generate response signals which are (1) substantially of the same phase from nuclei with uncoupled spins and (2) substantially of opposite phase from nuclei with coupled spins;

(c) acquiring the response signals generated in response to the first subsequence and first sequence to form a first set of recovered data;

(d) acquiring the response signals generated in response to the second subsequence and second sequence to form a second set of recovered data;

(e) subtracting one of the first and second data sets from the remaining data set; and

(f) generating one of an image and a spectrum of the sample responsive to the difference data set obtained in step (e).

4,706,025

METHODS OF PRODUCING IMAGE FORMATION FROM OBJECTS

William A. Edelstein, Schenectady, N.Y.; James M. S. Hutchison; Glyn Johnson, both of Aberdeen, Scotland; Thomas W. T. Redpath, Kincardineshire, Scotland, and John R. Mallard, Aberdeen, Scotland, assignors to National Research Development Corporation, London, England

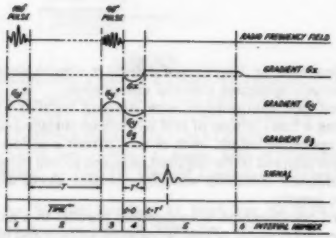
Continuation of Ser. No. 702,126, Feb. 15, 1985, Pat. No. 4,602,214, which is a continuation of Ser. No. 320,953, Nov. 9, 1981, Pat. No. 4,506,222. This application Jun. 27, 1986, Ser. No. 879,419

Claims priority, application PCT Int'l Appl., Mar. 13, 1981, PCT/GB81/00044

The portion of the term of this patent subsequent to Mar. 19, 2002, has been disclaimed.

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **1 Claim**



1. In a method of deriving image information from an object using nuclear magnetic resonance signals the improvement comprising:

subjecting an object to a continuous static magnetic field along an axis and carrying out a set of sequential steps which comprise:

(1) inverting selected nuclear spins in a selected plane in the presence of a plane selection gradient of the static magnetic field, the direction of said plane selection gradient being perpendicular to said plane;

(2) allowing the inverted spins to relax for an interval comparable with their spin-lattice relaxation time;

(3) exciting said selected nuclear spins in the presence of said plane selection gradient of the static magnetic field;

(4) rephasing the selected nuclear spins in the selected plane in a direction parallel to the direction of the said plane selection gradient by applying the said plane selection gradient in the reverse direction, applying a phase encoding gradient of the magnetic field having a gradient direction parallel to the selected plane for phase encoding the selected nuclear spins in the direction of the phase encoding gradient, applying a dephasing gradient of the static magnetic field having a gradient direction orthogonal to both the phase selection gradient direction and the phase encoding gradient direction, said rephasing, phase encoding and dephasing gradients all being applied simultaneously;

(5) removing the said rephasing, phase encoding and dephasing gradients and reading out the resultant free induction signal from the said object in the presence of a read gradient of the magnetic field having a gradient direction which is reverse to the direction of the said dephasing gradient;

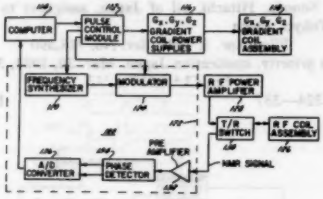
and then successively repeating the above set of sequential steps with different values of time integral of the phase encoding gradient, there being a recovery interval between the repetition of successive sets of steps.

4,706,026

METHOD FOR REDUCING IMAGE ARTIFACTS DUE TO PERIODIC SIGNAL VARIATIONS IN NMR IMAGING

Norbert J. Pelc, Wauwatosa, and Gary H. Glover, Waukesha, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Aug. 16, 1985, Ser. No. 766,842
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 34 Claims



1. A method for reducing artifacts in a desired image due to unwanted substantially periodic signal variations of NMR signals sensed in a plurality of views of a portion of an object being examined using nuclear magnetic resonance techniques, each view including irradiation of the object portion by an RF excitation pulse at the Larmor frequency to produce one of said NMR signals, said technique including application of a pulsed magnetic field gradient for spatial encoding along at least one dimensional axis of the object, said magnetic field gradient having a plurality of spatial encoding parameter values, each value corresponding to a respective view so as to encode spatial information into said NMR signals, said method comprising the steps of:

(a) determining a period T_B of said unwanted signal variations; and

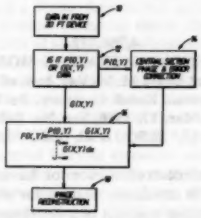
(b) selecting a temporal order of application of said gradient parameter values to produce a sequence of said NMR signals such that reordering of said NMR signals provides an apparent period of signal variation other than said period T_B.

4,706,027

METHOD FOR CORRECTING PHASE ERRORS IN MAGNETIC RESONANCE IMAGING DATA

Simon H.C. Hughes, Curnee, Ill., assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 28, 1986, Ser. No. 901,253
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 5 Claims



1. A method for correcting phase errors in magnetic resonance imaging data from an object under observation, comprising the steps of:

a. subjecting said object to magnetic field gradients and radio frequency pulses to produce sensitive line data and two dimensional Fourier transform (2D FT) magnetic resonance imaging data from said object, said magnetic field gradients defining a Fourier space, with said sensitive line data passing through Y=0 in said Fourier space and said 2D FT data lying along stepped paths in said Fourier space;

b. measuring the phase of said sensitive line data at Y=0 in said Fourier space;

c. modifying said sensitive line data as a function of said measured phase to obtain corrected sensitive line data which is equivalent to said sensitive line data with the effect of a first phase error in said sensitive line data removed;

d. calculating a second phase error in said 2D FT data on each of said stepped paths as a function of said corrected sensitive line data and the sum of said 2D FT data for each of said stepped paths;

e. modifying said 2D FT data on each of said stepped paths as a function of said calculated second phase errors for each respective path to obtain corrected 2D FT data for each path which is the equivalent of said 2D FT data for each path with the effect of said respective second phase errors for each path removed; and

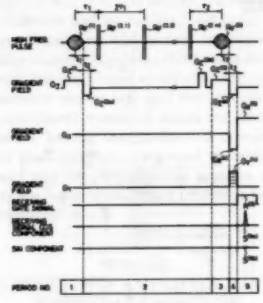
f. constructing a visual magnetic resonance image from the inverse two dimensional Fourier transform of said corrected 2D FT data.

4,706,028

NMR IMAGING METHOD

Kiyoshi Yoda; Hidenobu Itagaki, and Satoshi Fujimura, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1985, Ser. No. 784,064
Claims priority, application Japan, Oct. 12, 1984, 59-214907
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 5 Claims



1. An NMR imaging method for imaging flowing fluids comprising:

a first step of exciting nuclear spin in a given slice plane of a sample disposed in a magnetostatic field;

a second step of compensating for phase disorder in a direction of a first field gradient due to said first step and then applying at least one 180° RF pulse;

a third step of exciting again the nuclear spin in said slice plane; and

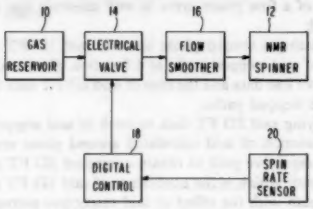
a fourth step of applying at least the first, a second and a third field gradients to derive an echo signal.

4,706,029

PULSED GAS CONTROL FOR NMR SPINNER SPEED ADJUSTMENT

Lloyd F. Hlavka, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Aug. 23, 1985, Ser. No. 768,548
Int. Cl.[4] G01N *24/02*; G01R *33/20*
U.S. Cl. 324—321 5 Claims



1. A system for controlling the spin of an NMR sample, comprising:

means for containing a source of gas,

means for translating gas flow into sample spin,

on/off gas valve with electrical control means, said valve controlling gas flow from said means for containing a source of gas to said means for translating gas flow into sample spin,

means for supplying digital control to said valve, and

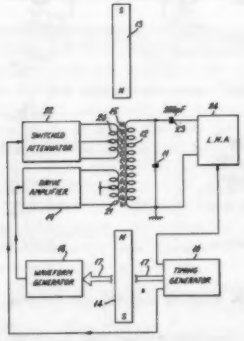
spin rate sensor for supplying rate of spin of an NMR sample to said means for supplying digital control.

4,706,030

WAVEFORM GENERATOR FOR NUCLEAR MAGNETIC RESONANCE APPARATUS

Reginald A. Willard, Middlesex, and William S. Percival, London, both of England, assignors to National Research Development Corporation, London, England

Filed Apr. 30, 1986, Ser. No. 857,309
Claims priority, application United Kingdom, May 3, 1985, 8511382; May 3, 1985, 8511354
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—322 9 Claims



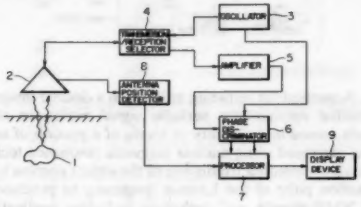
1. A waveform generator for a high Q resonant circuit to generate in the resonant circuit oscillations having an envelope which rises in magnitude linearly to a maximum and then immediately decays linearly to zero, comprising means for generating pulses formed by bursts of oscillations, each pulse having a rectangular envelope and two contiguous portions with a phase change of 180° at the junction of the two portions, means for adjusting the amplitude of one of the portions of each pulse, and means for adjusting the duration of the same or the other portion of each pulse.

4,706,031

METHOD AND SYSTEM FOR DETECTING AN OBJECT WITH A RADIO WAVE

Yoshihiro Michiguchi, Ibaraki; Fuminobu Takahashi, Katsuta; Kazuo Hiramoto, Hitachi; Masatsugu Nishi, Katsuta, and Shinji Sonoda, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 1, 1985, Ser. No. 718,390
Claims priority, application Japan, Mar. 30, 1984, 59-65013
Int. Cl.[4] G01V *3/12*
U.S. Cl. 324—337 12 Claims



10. A system for detecting location, shape and material of an object, comprising:

means for radiating a radio wave toward an object;

means for detecting an echo wave of said radio wave reflected from said object to detect an intensity of said echo wave;

phase difference for comparing a phase of said radiated radio wave with that of said echo wave to detect a phase difference between said radiated wave and said echo wave; and

means for displaying on a display unit the location and shape of said object on the basis of the intensity of said echo wave, and for displaying on said display unit the material of said object on the basis of said phase difference between said radiated wave and said echo wave.

11. A system for detecting an object according to claim 10, wherein said phase information extracting means determines whether said echo wave is in positive phase or negative phase relative to said radiated radio wave to thereby supply outputs which differ in dependence on positive and negative phases to said image displaying means.

4,706,032

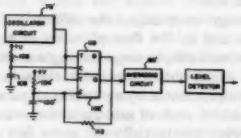
TONER CONCENTRATION MONITOR

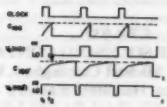
James D. Allen, and David M. McVay, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 17, 1986, Ser. No. 840,368
Int. Cl.[4] B05C *11/00*; G03G *15/02*
U.S. Cl. 328—1 6 Claims

1. In a toner concentration monitor having a capacitance probe immersible in developer mixture for sensing changes in the effective dielectric constant of a developer mixture whose dielectric constant changes with variations in the toner concentration in the mixture; the improvement comprising means for generating an electrical signal comprising a series of pulses of predetermined frequency and a pulse width variable in response to the changes in the effective dielectic constant of the developer mixture such that each pulse has a first portion of fixed duration during which the capacitance probe charges at a fast rate and a second portion of duration variable with the

effective dielectric constant of the developer mixture during which the capacitance probe charges at a slow rate; and





means for attenuating the duration of said first portion relative to said second portion so as to increase the percentage of the pulse attributable to the second portion.

4,706,033

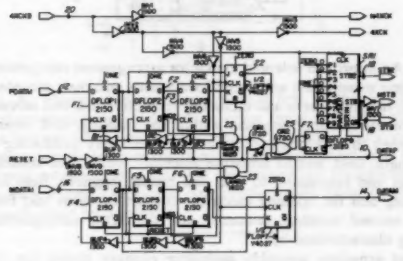
DATA RECOVERY AND CLOCK CIRCUIT FOR USE IN DATA TEST EQUIPMENT

Richard R. Robidoux, and Ronald B. Hoverman, both of Concord, N.H., assignors to Northern Telecom Limited, Montreal, Canada

Filed May 20, 1986, Ser. No. 865,087

Int. Cl.[4] H04L *7/00;* **H03K** *5/05*

U.S. Cl. 328—139 **6 Claims**



1. A data and clock recovery circuit comprising a digital data input port and a digital data output port, a plurality of n series-connected bistable elements, means for applying input data pulses to the first of said bistable elements, clock means for ripple clocking the input data pulses through said series-connected bistable elements, said clock having a frequency (n) times the normal bit rate of said input data pulses, first gate means for generating a fixed duration data output pulse corresponding to each data input pulse from first and second outputs of the series-connected bistable elements, second gate means for generating from a third and fourth output of the series-connected bistable elements, a strobe pulse stream, the strobe pulses having a predetermined phase relationship to the fixed duration data output pulses, and buffer means located between successive ones of the series-connected bistable elements to ensure that the data input pulses are moved through the series-connected bistable elements in sequence with successive phases of the clock, wherein said first gate means comprises a bistable element, the fixed duration data output pulses are derived at the bistable element by applying outputs respectively of the first and nth series-connected bistable elements to the bistable element inputs whereby output data pulses having a fixed duration of n−1 clock cycles are emitted from the bistable element.

4,706,034

SIGNAL DISCRIMINATING APPARATUS FOR EXTRACTING COMPONENT SIGNALS FROM A COMPOSITE SIGNAL

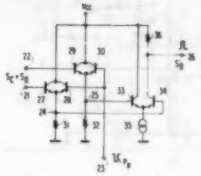
Kenji Kojima, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 504,111, Jun. 14, 1983, abandoned. This application Apr. 15, 1986, Ser. No. 852,388

Claims priority, application Japan, Jun. 17, 1982, 57-106012

Int. Cl.[4] H03K *5/00;* **H04N** *9/45*

U.S. Cl. 328—151 **2 Claims**



1. A signal discriminating apparatus for selectively extracting either first or second component signals from an input composite signal composed of said first and second component signals which are alternatively produced, comprising first and second transistor means having respective input terminal means for simultaneously receiving said input composite signal and having respective output terminals, controlling means, coupled to said first and second transistor means, for controlling the conduction, and, thus, the outputs of said first transistor means and said second transistor means, in accordance with sampling signals synchronized with said first or second component signals, supplying means for supplying said sampling signals to said controlling means, and differential circuit means coupled to said output terminals of said first and second transistor means for producing a differential output signal corresponding to either of said first or second component signals;

wherein each of said first and second transistor means has a base, a collector and an emitter, said input terminals are the bases of said first and second transistor means, said controlling means comprises a third and a fourth transistor means each having a base, a collector and an emitter, said third transistor means and said first transistor means, as well as said fourth transistor means and said second transistor means, having their collectors connected in common and their emitters connected in common, respectively, and said supplying means supplies said sampling signals to the bases of said third transistor means and said fourth transistor means.

4,706,035

HIGH EFFICIENCY AMPLIFIER HAVING A BOOTSTRAP CAPACITOR

Eise C. Dijkmans; Joseph G. G. Raets, both of Eindhoven, Netherlands, and Norbert J. L. Philips, Louvain, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 11, 1986, Ser. No. 838,728

Claims priority, application Netherlands, Mar. 18, 1985, 8500770

Int. Cl.[4] H03F *1/38, 3/30*

U.S. Cl. 330—156 **18 Claims**

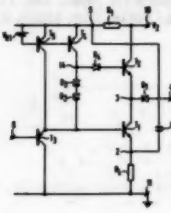
1. An amplifier arrangement comprising:

a first transistor having an emitter coupled to a first terminal for connection to a load which is coupled to a reference point, and a collector coupled by means of a first semicon-

ductor junction to a second terminal for a first supply voltage,

a second transistor having a collector-emitter path connected in series with the collector-emitter path of the first transistor, and having a collector coupled to a third terminal for a second supply voltage which is higher than the first supply voltage,

a circuit coupled between a base of the first transistor and a base of the second transistor which comprises a series arrangement of at least a second semiconductor junction and a third semiconductor junction poled in the same direction as the base-emitter junction of the first transistor,



and a fourth semiconductor junction which is poled in the same direction as the base-emitter junction of the second transistor, and

an input coupled to the base of the first transistor and the second transistor for receiving an input signal, characterized in that

the third terminal is coupled to a point between the third semiconductor junction and the fourth semiconductor junction by means of the series arrangement of a first resistor and a first current source, and

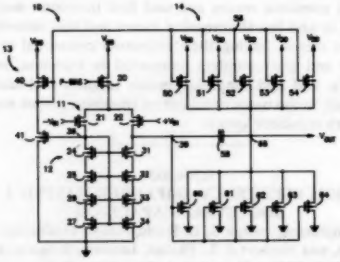
a capacitor is coupled between the first terminal and that end of the first resistor which is not connected to the third terminal.

4,706,036

DIFFERENTIAL AMPLIFIER HAVING RATIOED LOAD DEVICES

Michael E. Rebeschini, Hanover Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1986, Ser. No. 944,404
Int. Cl.[4] H03F *3/45, 3/30, 3/16*
U.S. Cl. 330—253 **6 Claims**



1. A differential amplifier having a differential input pair of transistors for receiving first and second input voltages and providing an output voltage proportional to a differential of the first and second input voltages, further comprising:

a plurality of series-connected load transistors coupled to each transistor of the differential input pair of transistors, said series-connected load transistors each having a control electrode connected together and to one transistor of the input of transistors, each of said series-connected load transistors having substantially equal first predetremined ocntrol electrode width and length dimensions which form a first composite predetermined control electrode dimension; and

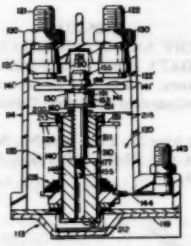
an output stage coupled to the differential input pair of transistors and to the first plurality of series-connected transistors, said output stage having a source output transistor and a sink output transistor, the sink output transistor being implemented by a plurality of parallel-connected sink transistors, each of said parallel-connected sink transistors having substantially the same first predetermined control electrode width and length dimensions to form a second composite predetermined control electrode dimension ratioed in a predetermined ratio with the first composite predetermined control electrode dimension.

4,706,037

SOFT-CONTACT SOLENOID CONTACTOR

Robert E. Prouty, and S. Michael Cunningham, both of Logansport, Ind., assignors to Hamilton Standard Controls, Inc., Farmington, Conn.

Filed Dec. 22, 1986, Ser. No. 945,143
Int. Cl.[4] H01F *7/12*
U.S. Cl. 335—248 **5 Claims**



1. An improved solenoid contactor arrangement comprising housing means, first and second stationary terminals mounted in the housing means and including respective first and second stationary terminal contacts within the housing, coil means mounted in said housing means for selectively producing a magnetic field, and an armature assembly within said housing means and responsive to said coil means magnetic field for making and for opening electrical contact between said first and second terminal contacts, said contactor arrangement being characterized by:

said armature assembly including plunger means for responding to said coil means by moving axially in response to a magnetic field produced by said coil means, a carrier subassembly joined to and moving with said plunger, and contact bridge means carried by said carrier subassembly for selectively making and opening electrical contact between said first and second terminal contacts;

stationary pole means fixed in axial register with said plunger, said plunger being reciprocable toward and away from said pole means;

first spring means for biasing said carrier assembly, said plunger and said contact bridge means toward an open limit position in which said contact bridge means is spaced from said first and second terminal contacts; and

wherein said carrier subassembly includes an elongate carrier joined at one end to said plunger, a stop sleeve slidably mounted on said carrier and a second spring means of the coil type mounted coaxially with said stop sleeve, said contact bridge means being mounted on said carrier in axial slidable relation therewith and axially outward of said stop sleeve relative to said plunger, said carrier having a flange positioned distally of said stop sleeve and

contact bridge means for limiting axial displacement of said stop sleeve and contact bridge means on said carrier to a predetermined range, said second spring means acting in compression at one end against said contact bridge means and at the other end against said stop sleeve for resiliently spacing said contact bridge means from said stop sleeve by said predetermined displacement range to cushion initial contact engagement between said contact bridge means and said first and second stationary terminal contacts, said second spring means being sufficiently yieldable for the carrier assembly to subsequently move to an overtravel limit position in which said stop sleeve is maintained in firm axial engagement with said contact bridge means by said plunger, and said plunger remains axially spaced from said pole means thereby to maximize the force with which said contact engagement between said contact bridge means and said first and second stationary terminal contacts is maintained.

4,706,038

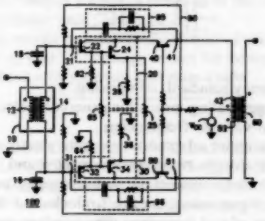
WIDEBAND LINEAR DARLINGTON CASCODE AMPLIFIER

Salar Navidi, Phoenix; Brent L. Trout, Mesa, and Fred C. Wernett, Glendale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 29, 1986, Ser. No. 913,166

Int. Cl.[4] H03F *3/26*

U.S. Cl. 330—271 **15 Claims**



1. An electrical circuit comprising a first Darlington pair configuration connected to an in-phase input activating node of a first cascoded device and a second Darlington pair configuration connected to an out-of-phase input activating node of a second cascode device, said first Darlington pair configuration and said second Darlington pair configuration being coupled to each other by a resistor.

4,706,039

AMPLIFIER ARRANGEMENT

Eise C. Dijkmans; Joseph G. G. Raets, both of Eindhoven, Netherlands, and Norbert J. L. Philips, Louvain, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 11, 1986, Ser. No. 838,729

Claims priority, application Netherlands, Mar. 18, 1985, 8500768

Int. Cl.[4] H03F *3/30*

U.S. Cl. 330—297 **15 Claims**

1. An amplifier arrangement comprising:

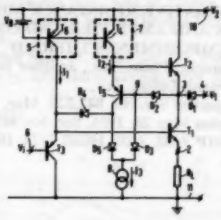
a first transistor having an emitter coupled to a first terminal for connection to a load which is coupled to a reference point, a collector coupled by means of a first semiconductor junction to a second terminal for a first supply voltage

a second transistor having a collector-emitter path connected in series with the collector-emitter path of the first transistor, and having a collector coupled to a third terminal for a second supply voltage which is higher than the first supply voltage,

a third transistor arranged as an emitter-follower and having a base for receiving an input signal and having an emitter coupled to a base of the first transistor, characterized in that

the third transistor is of a conductivity type opposite to that of the first transistor and the second transistor and its emitter is coupled to the third terminal by means of a first current source,

a first current path is coupled between the third terminal and an electrode of the third transistor which carries the input signal, which first current path comprises a series arrangement of at least a second current source, the emitter-collector path of a fourth transistor of the same conductivity type as the third transistor, and a second semiconductor junction,



the emitter of the fourth transistor is coupled to the base of the second transistor,

a second current path is coupled between the second terminal and the reference point and comprises series arrangement of a third semiconductor junction, a fourth semiconductor junction and a third current source,

a point between the collector of the fourth transistor and the second semiconductor junction is connected to the third current source by means of a fifth semiconductor junction, and

a base of the fourth transistor is connected to a point between the third semiconductor junction and the fourth semiconductor junction.

4,706,040

FREQUENCY SYNTHESIZER CIRCUIT

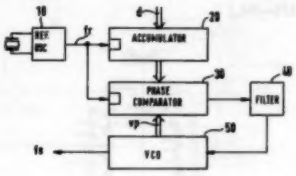
Soenke Mehrgardt, March, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed May 23, 1986, Ser. No. 866,878

Claims priority, application European Pat. Off., May 23, 1985, 85106351.1

Int. Cl.[4] H03L *7/08*

U.S. Cl. 331—1 A **10 Claims**



1. A frequency synthesizer circuit for generating an analog signal of digitally step-adjustable frequency, said circuit comprising:

a reference oscillator generating a reference signal;

a phase comparator comprising digital circuitry and having first and second inputs, a clock input and an output, said reference oscillator being coupled to said phase comparator second input;

a digital accumulator having its output connected to said phase comparator first input, having a first input receiving a numerical value, and having a clock input;

an analog low pass filter;

a voltage controlled oscillator having an output providing said analog signal, said voltage controlled oscillator output coupled to said digital accumulator clock input and said phase comparator clock input, and having an input coupled to said phase comparator output via said analog low pass filter;

said numerical value determining the frequency of said analog signal.

4,706,041

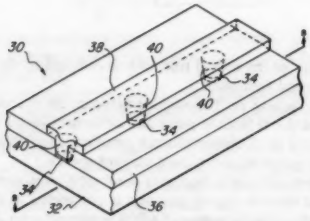
PERIODIC NEGATIVE RESISTANCE MICROWAVE STRUCTURES AND AMPLIFIER AND OSCILLATOR EMBODIMENTS THEREOF

Burhan Bayraktaroglu, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 842,526, Mar. 21, 1986. This application May 28, 1986, Ser. No. 868,212

Int. Cl.[4] H01P *3/08, 7/08;* **H03B** *7/14;* **H03F** *3/60*

U.S. Cl. 331—52 **23 Claims**



1. A monolithic microwave device, comprising:

(a) a transmission line segment consisting of a first conductor separated from a second conductor by solid dielectric; and

(b) a plurality of negative resistance devices in said dielectric located in groups periodically along said segment and connected to said first conductor and formed on said second conductor.

4,706,042

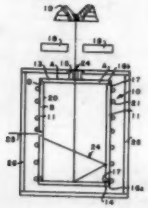
ATOMIC OR MOLECULAR MASER CAVITY RESONATOR

Samuel R. Stein, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed May 23, 1986, Ser. No. 867,847

Int. Cl.[4] H01S *1/06*

U.S. Cl. 331—94.1 **21 Claims**



1. An electrical resonator comprising a container having outer and inner surfaces, said container having a thin conductive outer layer and being formed substantially of dielectric material, said inner surface defining an internal cavity spaced from the outer surface of said container, said container being provided with an aperture therein for axial communication with the internal cavity of said container, said cavity having bonded on its inner surface an energy state minimizing coating, said container having means for excluding atomic or molecular species from a region of said resonator where r.f. magnetic fields are substantially radial.

4,706,043

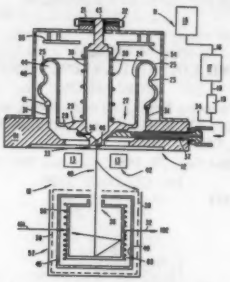
FREQUENCY STANDARD USING HYDROGEN MASER

Samuel R. Stein; Lindon L. Lewis, both of Boulder, and Thomas E. Smith, Westminster, all of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed May 23, 1986, Ser. No. 866,827

Int. Cl.[4] H01S *1/06*

U.S. Cl. 331—94.1 **30 Claims**



1. A frequency standard, comprising:

frequency-generating means for generating electromagnetic energy at variable frequencies;

a hydrogen maser adapted to generate electromagnetic energy at hydrogen resonance frequency; and

electronic means connecting said hydrogen maser to said frequency-generating means to lock and maintain the frequency of said frequency-generating means at an accurate, stable, standard frequency with the electromagnetic energy generated by the hydrogen maser at hydrogen resonance frequency,

said hydrogen maser comprising:

a microwave cavity assembly comprising a dielectric container having outer and inner surfaces, said outer surface of said container defining a microwave cavity tuned to about the hydrogen resonance frequency, said container having an aperture therein for open communication between the inner and outer portions of said container, and having on an end wall a discontinuous conductive coating with a predetermined configuration to suppress undesirable oscillation of the microwave cavity;

a dissociator having a chamber for generating hydrogen atoms with an opening serving as an exit and forming a narrow beam of said hydrogen atoms and yieldable member means; and

means for moving the yieldable member means to align the narrow beam of hydrogen atoms with the aperture.

4,706,044

ASTABLE MULTIVIBRATOR WITH DUTY CYCLE COMPENSATION

Thaddeus P. Okrzesik, Chicago, and Robert J. Alvord, Elmwood Park, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 15, 1986, Ser. No. 919,157

Int. Cl.[4] H03K *3/281*

U.S. Cl. 331—113 R **3 Claims**

1. In combination with an astable multivibrator including a

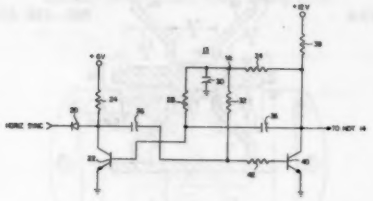
first and a second transistor, each having an input and an output;

a first voltage source coupled to the output of said second transistor;

a second, higher, voltage source coupled to the output of said first transistor;

DC voltage means coupled to the input circuits of both said transistors;

first and second RC timing networks interconnecting the input and output circuits of said transistors for determining the frequency of said multivibrator and the respective duty cycles of said transistors;



means supplying a sync pulse to the input of said first transistor for controlling its turn on time to alter the frequency of said multivibrator;

a horizontal output transistor coupled to the output of said first transistor; and

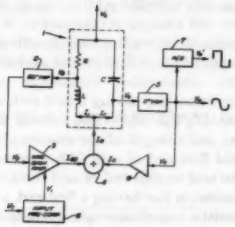
integrating means coupled to the output of said first transistor and to said DC voltage means for compensating said multivibrator to maintain said duty cycle.

4,706,045

VOLTAGE CONTROLLED OSCILLATOR WITH DUAL LOOP RESONANT TANK CIRCUIT

Kenneth W. Ouyang, Huntington Beach, and Richard W. Hull, Laguna Hills, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Dec. 10, 1986, Ser. No. 940,038
Int. Cl.[4] H03B *5/00*
U.S. Cl. 331—117 FE **14 Claims**



1. A voltage controlled oscillator comprising:

a resonant tank having a predetermined resonant frequency and including first and second tap points for tapping out-of-phase oscillating signals occuring internally within said tank;

first tap means coupled to said first tap point of said tank for providing a first feedback signal;

second tap means coupled to said second tap point of said tank for providing a second feedback signal which is out-of-phase with said first feedback signal;

summing means for combining said first and second feedback signals to produce a resultant feedback signal and for feeding said resultant feedback signal back into said tank to sustain the oscillating signals within said resonant tank; and

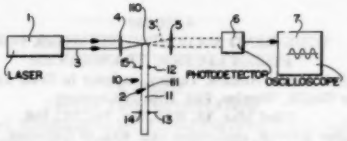
magnitude changing means, responsive to a supplied control voltage, for varying the magnitude of said second feedback signal to thereby advance or delay the phase angle of said resultant feedback signal relative to said internal oscillating signals and change the frequency of oscillation of said internal oscillating signals.

4,706,046

RESONATOR MADE OF NONPIEZOELECTRIC MATERIAL WITH HIGH QUALITY COEFFICIENT

Eugène J. Dieulesaint, Saint-Maur, and Daniel R. Royer, Sainte-Genevieve des Bois, both of France, assignors to Etat Francais as represented by the Deleque General pour l'Armement, France

Filed May 23, 1986, Ser. No. 866,351
Claims priority, application France, May 30, 1985, 85 08087
Int. Cl.[4] H03B *5/30*
U.S. Cl. 331—155 **14 Claims**



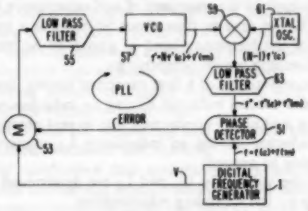
1. A resonator of nonpiezoelectric material with a high quality coefficient comprising: a monocrystal of nonpiezoelectric material with a low attenuation of bulk elastic waves, means for supporting the monocrystal attached to the monocrystal at points corresponding to vibration nodes, thermal means for directly causing an excitation of the monocrystal at the natural frequency of the monocrystal and optical means for detecting periodic motions of the resonator without mechanical contact with the resonator.

4,706,047

FREQUENCY EXTENDED DIGITALLY GENERATED FM

Louis J. Avila, Costa Mesa; John E. Merritt, Newport Beach, and Norman G. Hempling, Villa Park, all of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Dec. 1, 1986, Ser. No. 936,528
Int. Cl.[4] H03C *3/00*
U.S. Cl. 332—19 **7 Claims**



1. A circuit for increasing the frequency of a digitally generated FM signal, comprising:

digital means for generating a frequency modulated (FM) signal; and

coupled to the FM signal, a phase lock loop having a voltage controlled oscillator (VCO) whose output center frequency is higher than the carrier frequency of the FM signal, wherein the phase lock loop comprises:

summation means;

a first low pass filter having an input coupled to an output of the summation means;

a voltage controlled oscillator having an input coupled to an output of the first low pass filter;

a second low pass filter having an input coupled to an output of the voltage controlled oscillator; and

a phase detector having a first input coupled to an output of the second low pass filter, a second input coupled to the digitally generated FM signal, and an output coupled to an input of the summation means;

wherein the digitally generated FM signal comprises a carrier frequency and a modulating frequency;

the phase lock loop boosts the carrier frequency, but not the modulating frequency;

a mixer is coupled between the VCO and the second low pass filter, said mixer having a first input coupled to the output of the VCO, and an output coupled to the input of the second low pass filter; and

a reference oscillator is coupled to a second input of the mixer.

4,706,048

WIDE-BAND MATCHING NETWORK FOR PIEZOELECTRIC TRANSDUCER

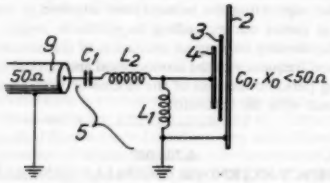
Abdullah Atalar, Ankara, Turkey, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Mar. 15, 1985, Ser. No. 712,108

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1984, 3409927

Int. Cl.[4] H03H *7/38, 9/15*

U.S. Cl. 333—32 **5 Claims**



1. A wide band network comprising means for matching the impedance of a signal-conducting line having a characteristic impedance of about 50 ohms to an electrode, a piezoelectric transmitter having said electrode as a part thereof, said transmitter having an equivalent ohmic resistance R_Ω series with an equivalent capacitance C_o, the resistance R_Ω being approximately one-tenth of the reactance of said capacitance C_o, and a reactance X_o not greater than about 50 ohms at a center frequency f_o of the frequency band of signals to be transmitted and said matching means comprising:

a series combination of a first capacitor having capacitance C_1 and a second inductor having an inductance L_2 connecting said signal-conducting line to said electrode; and

a first inductor having an inductance L, connecting said electrode to ground;

wherein the values C_1, L_1, and L_2 are determined approximately by the following relationships:

$$C_1 \cong \frac{1}{5} C_o$$

$$L_1 \cong \frac{1}{(2\pi f_o)^2} \frac{1}{C_o}$$

$$L_2 \cong \frac{1}{(2\pi f_o)^2} \frac{1}{C_1}.$$

4,706,049

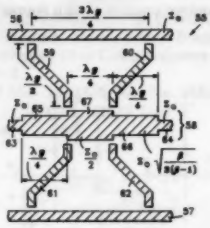
DUAL ADJACENT DIRECTIONAL FILTERS/COMBINERS

Michael Dydyk, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 3, 1985, Ser. No. 783,881

Int. Cl.[4] H01P *1/213, 5/18*

U.S. Cl. 333—110 **9 Claims**



1. A dual adjacent directional filter (DADF) for filtering/combining a signal having a wavelength (λ_g), said DADF having first, second, third, fourth, fifth and sixth ports, said DADF comprising:

a first transmission line for transmitting said signal, said first transmission line having a first end, a second end, and a characteristic impedance value (Z_o), said first end of said first transmission line being coupled to said third port of said DADF and said second end of said first transmission line being coupled to said fourth port of said DADF;

a second transmission line for transmitting said signal, said second transmission line having a first end, a second end, and a characteristic impedance value (Z_o), said first end of said second transmission line being coupled to said fifth port of said DADF, said second end of said second transmission line being coupled to said sixth port of said DADF and said second transmission line being juxtaposed to said first transmission line;

a third transmission line having a first end, a second end, an impedance ($Z_0/2$), and a length of one-quarter of said wavelength ($\lambda_g/4$), said third transmission line being disposed between said first and second transmission lines;

a fourth transmission line having a first end, a second end, an impedance ($Z_0\sqrt{\beta/(2(\beta-1))}$), where β is a coupling coefficient, and a length of one-quarter of said wavelength ($\lambda_g/4$), said second end of said fourth transmission line being coupled to said first end of said third transmission line;

a fifth transmission line having a first end, a second end, an impedance ($Z_0\sqrt{\beta/(2(\beta-1))}$), where β is a coupling coefficient, and a length of one-quarter of said wavelength ($\lambda_g/4$), said first end of said fifth transmission line being coupled to said second end of said third transmission line;

a sixth transmission line having a first end, a second end, and a characteristic impedance value (Z_0), said first end of said sixth transmission line being coupled to said first port of said DADF and said second end of said sixth transmission line being coupled to said first end of said fourth transmission line; and;

a seventh transmission line having a first end, a second end, and a characteristic impedance value (Z_0), said first end of said seventh transmission line being coupled to said second end of said fifth transmission line and said second end of said seventh transmission line being coupled to said second port of said DADF;

first filtering means for filtering said signal, said first filtering means being disposed between said first transmission line and said; third transmission line

second filtering means for filtering said signal, said second

filtering means being disposed between said second transmission line and said third transmission line.

4,706,050

MICROSTRIP DEVICES

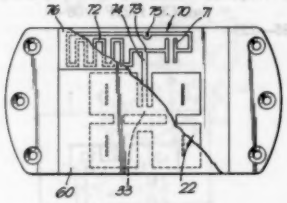
Frank P. Andrews, Easton, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Sep. 4, 1985, Ser. No. 772,522

Claims priority, application United Kingdom, Sep. 22, 1984, 8424042; Mar. 15, 1985, 8506715

Int. Cl.[4] H01P 1/203, 7/08; H01Q 1/38

U.S. Cl. 333—205 6 Claims



1. A method of tuning a microstrip device of the kind comprising a dielectric substrate and a planar electrically-conductive region on a surface of the substrate, wherein the frequency of tuning of the device is initially measured, and wherein a part at least of a surface of the device is thereafter coated by a silk-screen process with a plurality of layers of dielectric ink or paint, each of which layers has the same predetermined thickness, superimposed directly on top of one another so as thereby to increase the thickness of the dielectric coating in a plurality of equal steps thereby to reduce the frequency of tuning of the device progressively from its initially measured value to a desired final value.

4,706,051

METHOD OF MANUFACTURING A WAVEGUIDE FILTER AND WAVEGUIDE FILTER MANUFACTURED BY MEANS OF THE METHOD

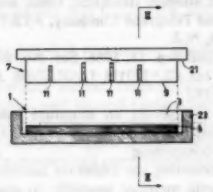
Pieter J. Dieleman; Willem Goedbloed; Roelof P. De Jong, all of Eindhoven, and Theodorus M. Oosterwijk, Zwolle, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 628,180, Jul. 6, 1984, abandoned. This application Dec. 9, 1986, Ser. No. 940,236

Claims priority, application Netherlands, Jul. 8, 1983, 8302439

Int. Cl.[4] H01P 1/20, 11/00; B21C 23/18

U.S. Cl. 333—212 6 Claims



1. A waveguide filter having side walls and an apertured separating wall for defining communicating resonant cavities on opposite sides of said separating wall;

said waveguide filter comprising first and second complementary box-shaped bodies each including side walls defining an open side at which the bodies are joined and further including an internal partition extending between opposing ones of the side walls for forming a portion of said apertured separating wall;

each body comprising an impact extruded body having both the internal partition and the side walls thereof formed from a single slug of material which, during extrusion, is forced to fill a space defined between a box-shaped die and a punch inserted into the die.

2. A method for making box-shaped bodies which, when joined, collectively form a waveguide filter including side walls and an apertured separating wall having smooth internal surfaces for defining accurately-dimensioned communicating resonant cavities on opposite sides of said separating wall, said method comprising the steps of:

(a) placing a slug of an impact-extrudable material into a box-shaped die; and

(b) forcefully inserting a punch into the die to effect impact extrusion of one of the box-shaped bodies, said die and said punch defining therebetween spaces corresponding to the shape and dimensions of said one box-shaped body.

4,706,052

DIELECTRIC RESONATOR

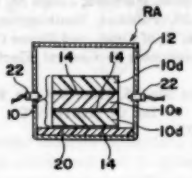
Jun Hattori, Nagaokakyo, and Youhei Ishikawa, Kyoto, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 6, 1985, Ser. No. 806,025

Claims priority, application Japan, Dec. 10, 1984, 59-261588; Dec. 10, 1984, 59-261589

Int. Cl.[4] H01P 7/00

U.S. Cl. 333—219 12 Claims



1. A dielectric resonator which encloses an electromagnetically shielded internal space, and which comprises:

a substantially cylindrical dielectric resonator unit having a cylindrical axis, and being surrounded by said space except on one axial end of said unit, said unit comprising a plurality of dielectric bodies which are combined adjacently into said unit, with a boundary region being formed between each two adjacent dielectric bodies;

connecting means for rigidly connecting said adjacent dielectric bodies to each other;

support means for supporting said one axial end of said dielectric resonator unit thereon;

a metallic conductive case accommodating said dielectric resonator unit on said support means therein, said case and said support means defining said internal space; and

input and output members in said internal space and extending through said case for electrical connection of said dielectric resonator with an external circuit,

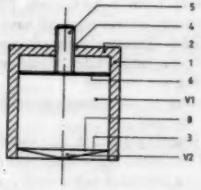
said dielectric resonator being configured to have a principal resonant frequency of a desired mode, and a resonant frequency of a spurious mode, said resonant frequency of spurious mode being shifted into a frequency substantially higher than said principal resonant frequency by passing of said spurious mode through said boundary region between said at least two adjacent dielectric bodies.

4,706,053

MICROWAVE METALLIC CAVITY

Andrea Giavarini, Milan, Italy, assignor to GTE Telecomunicazioni, S.p.A., Milan, Italy

Filed Mar. 31, 1986, Ser. No. 846,774
Claims priority, application Italy, Jul. 29, 1985, 21751 A/85
Int. Cl.[4] H01P 7/06, 1/30
U.S. Cl. 333—229 14 Claims



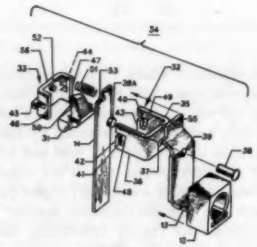
1. A microwave metallic cavity comprising a hollow body, which encloses a first volume, and a base which in combination with said hollow body determine the total volume and the resonating frequency of said cavity, such first volume being increasing as long as operating temperature increases, characterized in that said base is made up of a geometrical shape which encloses a second volume, such second volume decreasing as long as operating temperature increases, wherein said hollow body has a thickness greater than the thickness of said base, and a coefficient of linear expansion greater than the coefficient of linear expansion of said base.

4,706,054

THERMAL MAGNETIC TRIP UNIT FOR MOLDED CASE CIRCUIT BREAKERS

Thomas G. Hampton, Hartford; James M. Mitsch, West Hartford; Joseph M. Palmieri, Southington; David S. Parker, South Windsor, all of Conn., and Donna C. DeRosier, Springfield, Mass., assignors to General Electric Company, New York, N.Y.

Filed Sep. 15, 1986, Ser. No. 907,332
Int. Cl.[4] H01H 9/00
U.S. Cl. 335—203 20 Claims



1. A magnetic trip unit for molded case circuit breakers comprising:

a metal conductor electrically connected in series within an electric circuit;

a U-shaped magnet piece consisting of a first metal plate with a first pair of extending side arms encompassing a part of said metal conductor and inducing a magnetic force in a first direction upon transport of circuit current through said metal conductor; and

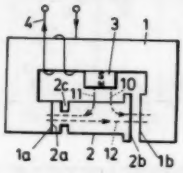
a U-shaped armature in magnetic relation with said magnetic piece consisting of a second metal plate with a second pair of extending side arms, said first and second extending side arms being arranged in an overlapping relation, said armature being attracted to said magnet piece when said circuit exceeds a first threshold value, said armature side arms overlapping said magnet piece side arms from in excess of 1% of the length of said magnet piece side arms to less than 75% of said magnet piece side arms length.

4,706,055

ELECTROMAGNETIC ACTUATOR HAVING RELUCTANCE ADJUSTING MEANS

Tokio Uetsuhara, Urawa, Japan, assignor to Mitsubishi Mining & Cement Co., Ltd., Tokyo, Japan

PCT No. PCT/JP85/00314, § 371 Date Jan. 21, 1986, § 102(e) Date Jan. 21, 1986, PCT Pub. No. WO86/00168, PCT Pub. Date Jan. 3, 1986
PCT Filed Jun. 4, 1985, Ser. No. 824,019
Claims priority, application Japan, Jun. 8, 1984, 59-116499
Int. Cl.[4] H01F 7/08
U.S. Cl. 335—229 1 Claim



1. An electromagnetic actuator comprising,

a stationary element made of soft, magnetic material, the stationary element having a plurality of magnetic poles;

a permanent magnet, one magnetic pole of the permanent magnet being secured to the stationary element;

a moveable element made of soft, magnetic material, the moveable element being faced with the magnetic poles of the stationary element and the other magnetic pole of the permanent magnet through narrow gap to form a magnetic circuit arranged in parallel to the direction of magnetic flux generated by the permanent magnet;

a means for adjusting magnetic reluctance to control the magnetic distribution in the magnetic circuit parallel to the direction of magnetic flux of the permanent magnet, which means magnetically saturates against the magnetomotive force caused by the permanent magnet; and

a coil element wound around the stationary element, the coil being so arranged as to energize the magnetic circuit, whereby the moveable element is reciprocally moved with respect to the stationary element when electric current is flowed through the coil.

4,706,056

ELECTRICAL RELAY APPARATUS

Harold E. McCullough, Blacklick, Ohio, assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 11, 1986, Ser. No. 906,023
Int. Cl.[4] H01H 51/08, 7/08, 3/00
U.S. Cl. 335—192 6 Claims

1. A relay (1) having an armature assembly (14) and a contact assembly (13) in combination with a magnetic member assembly (12) comprising

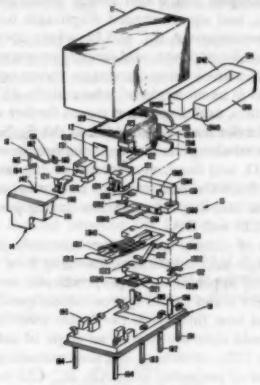
means for mounting the armature assembly with respect to the magnetic member assembly to enable magnetic flux generated by pole areas of the magnetic member assembly to activate the armature assembly

characterized in that

said mounting means comprises

spring means (16) for mounting the armature assembly to the magnetic member assembly with said spring means configured for generating a torsional moment in combination with a cantilever force on the armature assembly for

maintaining the armature assembly in relationship with the magnetic member assembly to operate and release the



contact assembly in response to the generated magnetic flux.

4,706,057

MAGNET OF A NUCLEAR SPIN TOMOGRAPH

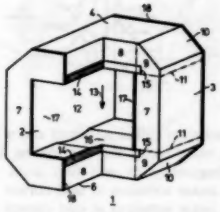
August Schwab, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 7, 1986, Ser. No. 860,627

Claims priority, application Fed. Rep. of Germany, May 23, 1985, 3518852

Int. Cl.[4] H01F *13/00*

U.S. Cl. 335—284 **14 Claims**



1. A magnet for generating a substantially homogeneous magnetic field in a space large enough to receive a human patient, for use in a nuclear spin tomograph, said magnet comprising:

two mutually parallel first rectangular prisms spaced from one another;

two mutually parallel second rectangular prisms spaced from one another, said second rectangular prisms being disposed at opposite ends of and perpendicularly with respect to said first rectangular prisms, each of said prisms being made of a magnetized permanent magnetic material; and

linking means including at least four elongate prismatic elements for coupling said prisms to each other to form an elongate body defining a substantially rectangular prismatic cavity with a longitudinal axis of symmetry, said elongate body having a cross-section with a substantially rectangular outer perimeter, each of said elongate prismatic elements serving to connect a respective pair of said prisms, said first rectangular prisms having respective inner surfaces defining said cavity and respective outer surfaces opposite said cavity, said prisms being permanently magnetized upon assembly of said elongate body so that field lines of a magnetic field in said first rectangular prisms are parallel to and oppositely directed with respect to field lines of a magnetic field in said cavity, so that the field lines of the magnetic field in said first rectangular prisms are connected to respective field lines of the magnetic field in said cavity via said elongate prismatic elements and via said second rectangular prisms, and so that the field lines in said first rectangular prisms have a density increasing from said inner surfaces toward said outer surfaces, said first rectangular prisms extending parallel to the magnetic field in said cavity and said second rectangular prisms extending perpendicularly with respect to the magnetic field in said cavity, the field lines of the magnetic field in said cavity being oriented perpendicularly with respect to said axis.

4,706,058

MINIATURE INDUCTOR WITH MOLDED COVER

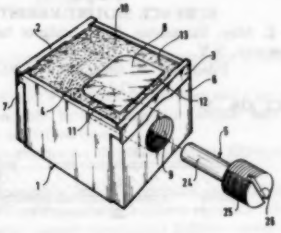
Guy Barbier, Orleans, and Jean-Paul Amory, Fleury les Aubrais, both of France, assignors to Alcatel, Paris, France

Filed Sep. 2, 1986, Ser. No. 902,832

Claims priority, application France, Sep. 19, 1985, 85 13918

Int. Cl.[4] H01F *21/06*

U.S. Cl. 336—96 **3 Claims**



1. Miniature variable inductor comprising a coil, a pair of connecting skids to which said coil is soldered, a movable ferromagnetic core, a screwthread on at least part of said core, an injection-molded plastics cover in the form of a hollow die with two oppositely disposed lateral walls to which said connecting skids are clipped, a solid part of said cover and a hollow space between said two walls, a central opening through said two walls, said solid part of said cover and said hollow space defining a housing for said core, and a resin encapsulating said coil, which is disposed in said hollow space coaxially with said central opening, which has a threaded portion where it passes through said solid part of said cover complementary to the thread on said core.

4,706,059

ELECTRICAL FUSE ASSEMBLY

Fritz Schmitt, Russelsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 20, 1986, Ser. No. 876,772

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1985, 3530354

Int. Cl.[4] H01H *85/04*

U.S. Cl. 337—297 **3 Claims**

1. In a vehicle electrical fuse assembly of the type having a replaceable fuse and a fuse holder, the improvement comprising,

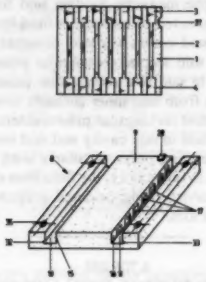
a flexible carrier film,

a printed conductor applied to said film to serve as said replaceable fuse,

electrical terminals connected to said fuse holder and

adapted to make electrical contact with said printed conductor, and

removable clamping means for clamping said film to said holder and for flexing said film so as to urge said printed



conductor into electrical contact with said terminals to complete said fuse assembly, whereby said fuse may be easily replaced by removing said clamping means and replacing said film.

4,706,060

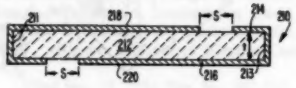
SURFACE MOUNT VARISTOR

John E. May, Skaneteles, N.Y., assignor to General Electric Company, N.Y.

Filed Sep. 26, 1986, Ser. No. 911,929

Int. Cl.[4] H01C *7/10*

U.S. Cl. 338—20 **11 Claims**



1. A varistor comprising:

a varistor body having a first major surface and an opposed second major surface;

a first electrode disposed on at least a portion of said first major surface and on at least a portion of said second major surface;

a second electrode disposed on at least a portion of said first major surface and on at least a portion of said second major surface;

said first and second electrodes being counter-symmetrically disposed on said varistor body about an axis lying midway between and parallel to said first and second major surfaces, wherein the proximal distance between said portions of said first and said second electrodes disposed on the same major surface of said varistor body is greater than the distance between said first and second major surfaces.

4,706,061

COMPOSITION SENSOR WITH MINIMAL NON-LINEAR THERMAL GRADIENTS

Robert G. Johnson, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 28, 1986, Ser. No. 901,215

Int. Cl.[4] H01L *7/00, 29/06;* **B32B** *3/10, 15/04*

U.S. Cl. 338—34 **9 Claims**

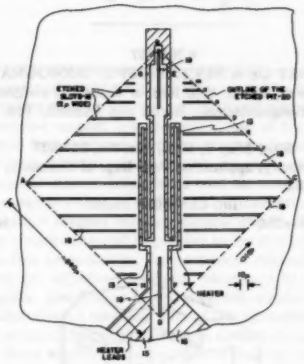
1. A gaseous composition sensor comprising:

a semiconductor body comprising (100) silicon and having a (100) plane and a <100> direction, a first surface of the body being substantially parallel to the (100) plane;

a thin film layer of Si_3N_4 covering at least a portion of said first surface;

square shaped diaphragm means comprising the thin film Si_3N_4, said square shaped diaphragm means having successive corners A,B,C and D, where corners B and D are diagonally opposite, said diaphragm means being oriented so that a line joining diaphragm means opposite corners B and D is at an angle of substantially 45° to the <110> direction, said diaphragm means further comprising resistive heater means embedded in the Si_3N_4 layer generally centered along the diagonal diaphragm area from corners B to D, said diaphragm means having lines of lateral heat flow from the heater means over most of the diaphragm means, said diaphragm means having perimeter lines AB, BC, CD and DA;

a series of closely spaced approximately parallel first slots through said diaphragm, the length of said slots being aligned approximately perpendicular to the line joining corners B and D and approximately parallel to the lines of lateral heat flow from the heater over the diaphragm so that said slots are thus at an angle of substantially 45° to the <110> direction, said slots extending at the outer end to one of perimeter lines AB, BC, CD and DA, said slots providing openings through the Si_3N_4 to the silicon for purposes of etching the silicon;



two additional slots called a second and a third slot aligned with each other along the line joining B and D and oriented orthogonally to said first slots, said second slot having its outer terminus at said corner B, said third slot having its outer terminus at said corner D;

and a square shaped shallow flat bottomed anisotropically etched pit in said silicon beneath said square shaped diaphragm means and conforming to said diaphragm means in orientation and size.

8. A method of fabricating a microbridge gaseous composition sensor comprising a silicon nitride thin film diaphragm covering a shallow depression etched into a silicon substrate, the steps comprising:

providing a single crystal silicon substrate comprising (100) silicon and having a (100) plane and a <110> direction, with a first surface of the substrate being substantially parallel to the (100) plane;

depositing a thin-film layer of silicon nitride onto the first surface to become a diaphragm;

providing an electrical heater on a portion of said silicon nitride layer by forming a thin film strip of resistive metal thereon;

planning a square depression in said silicon surface beneath said Si_3N_4 layer, where one side of said square is parallel with the <110> direction of said silicon, said square having first and second adjacent sides and third and fourth adjacent sides;

preparing a first series of closely spaced parallel slots through the Si_3N_4 and oriented at substantially 45° to the <110> direction and to the first and second adjacent sides;

preparing a second series of closely spaced parallel slots through the Si_3N_4, the slots lying in a direction parallel to the first series slots and oriented at substantially 45° to the <110> direction and to the third and fourth adjacent sides;

said slots being of differing lengths and each slot having an exterior end terminating at the first, second, third or fourth side;

preparing another pair of slots axially aligned with each other and oriented orthogonally to the previous defined slots and located between the first and second series of slots; and,

applying an anisotropic etch through said slots to the silicon first surface, the slots being oriented at substantially 45° to the <110> direction, to undercut the diaphragm and create a shallow square depression.

4,706,062

POTENTIOMETER

Erik Männle, Oberkirch, and Peter-Josef Bauer, Bühl, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

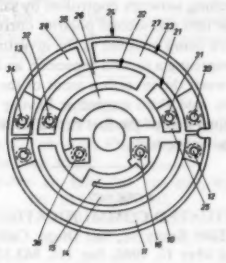
PCT No. PCT/DE84/00270, § 371 Date Jul. 18, 1985, § 102(e) Date Jul. 18, 1985, PCT Pub. No. WO85/03594, PCT Pub. Date Aug. 15, 1985

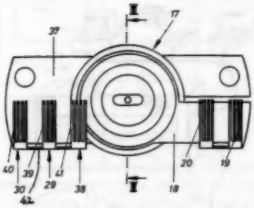
PCT Filed Dec. 10, 1984, Ser. No. 765,432

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1984, 3403944; May 4, 1984, 3416495

Int. Cl.[4] H01C *10/36*

U.S. Cl. 338—172 **12 Claims**





1. A potentiometer, in particular for an electrical gas pedal in motor vehicles, comprising, a potentiometer plate provided with at least one collector path formed as a resistor path and at least one sliding path which extends over the length of said collector path, and also provided with a plurality of contact paths spaced from said collector path and each having a beginning and an end which define switch-on and switch-off points, said contact paths being arranged concentrically relative to one another; and a mechanically actuatable potentiometer setting member having a slider engaged with said sliding path and said collector path so as to slide on said collector path and to pick up an electric control voltage, said potentiometer setting member also having contact fingers arranged concentrically relative to one another and fixedly connected with said potentiometer setting member so as to rotate together with the latter in sliding engagement with a respective one of said contact paths, said contact paths of said potentiometer plate and said contact fingers of said potentiometer setting member together forming electrical switches.

4,706,063

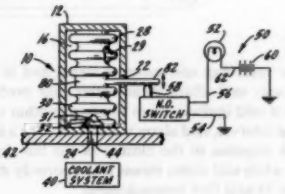
PRESSURE-BIASED, TEMPERATURE SENSOR

Robert R. Kelly, Hoffman Estates, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 1, 1986, Ser. No. 857,864

Int. Cl.[4] B60Q *1/00*

U.S. Cl. 340—60 **5 Claims**



1. A pressure-biased, temperature sensor for a fluid system comprising:

a housing defining a chamber, a first port and a second port,

a first expandable bellows operator within said housing defining a sealed volume;

a temperature-responsive fluid substantially filling the sealed volume;

a second expandable bellows operator in serial alignment with said first expandable bellows operator within said housing, said second expandable bellows operator defining a fluid passage and a cavity, which cavity communicates with said fluid system through said second port;

means, communicating with said chamber, for providing fluid at a reference pressure;

a signal circuit having signal means, switch means and means for receiving electrical energy, which signal circuit is completed by said switch means to energize said signal means; and

a switch actuation means mounted between and operable by said first expandable bellows operator and said second expandable bellows operator, which actuation means contacts said switch means, said actuation means having a portion extending through said first port to contact said switch means;

said first expandable bellows operator and second expandable bellows operator being operable to move said switch actuation means to close said switch means and complete said signal circuit in response to an over-temperature condition, and in response to an under-pressure condition.

4,706,064

BURGLAR ALARM WITH A MULTI-PHASE CIRCUIT, FAIL-SAFE CONTROL CIRCUIT, AUTOMATIC REARM CIRCUIT AND TWO-STEP DISARMING CIRCUIT

Shih-Ming Hwang, No 11, Alley 12, Lane 7, Ching-Tyan St., Taipei, Taiwan

Filed Aug. 25, 1986, Ser. No. 899,556

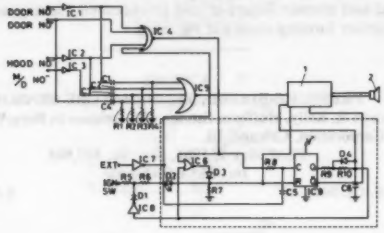
Int. Cl.[4] B60R *25/10*

U.S. Cl. 340—63 **2 Claims**

1. A burglar alarm system for an automotive vehicle having doors and an ignition switch:

alarm means operative when armed to sound an alarm signal

in response to the opening of a door of said vehicle and being inoperative to sound said alarm when disarmed, two step disarming means for temporarily disarming said alarm means in response to receiving a first external signal and for disarming said alarm means in response to said first external signal followed by the operation of the ignition switch of said vehicle within a predetermined time interval after receiving said external signal and to automatically rearm said alarm means after said predetermined interval if said ignition is not operated within said predetermined interval, said alarm means sounding a short chirp signal in response to the closure of the last door of said vehicle while said alarm means is temporarily disarmed in response to said first external signal.

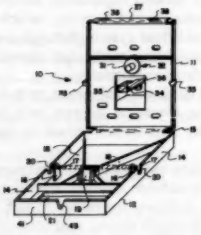


4,706,065

PULL STATION

Charles R. Kovacic, Mundelein, and David A. Noshay, Crystal Lake, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 11, 1985, Ser. No. 787,350
Int. Cl.[4] G08B *25/00*
U.S. Cl. 340—303 **19 Claims**



1. A pull station for generating an alarm signal upon manual activation comprising:

a housing of unitary construction having integral cover and base portions, said housing also having a hinge integrally formed with said integral cover and base portions, said cover portion having handle means so that said cover portion can be pulled away from said base portion when an alarm signal is to be generated;

break glass holding means provided on one of said portions for receiving a glass structure to be broken when said cover portion is pulled away from said base portion;

glass breaking means having a camming surface to ride past said glass structure when sid portions are closed and having a breaking surface for breaking said glass structure when said cover portion is pulled away from said base portion; and,

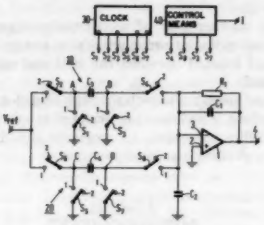
alarm signal generating means for generating said alarm signal when said cover portion is pulled.

4,706,066

SWITCH CAPACITOR D/A CONVERTER HAVING A DISTORTION REDUCING CAPACITOR

Eise C. Dijkmans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1985, Ser. No. 793,873
Claims priority, application Netherlands, Jul. 2, 1985, 8501896
Int. Cl.[4] H03M *1/66*
U.S. Cl. 340—347 DA **10 Claims**



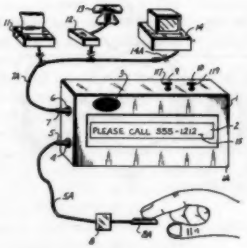
1. A digital-to-analog converter for converting a one-bit coded signal into an analog signal, comprising: an integrator for integrating current pulses of a first polarity when the coded signal has a first value and for integrating current pulses of a second polarity when the coded signal has a second value, wherein the integrator comprises an operational amplifier having an inverting input, a non-inverting input coupled to a first terminal for applying a first reference voltage, and an output coupled to the inverting input at least by means of a first capacitor, a switching network controlled by said coded signal for generating the first and second polarity current pulses, said switching network being coupled to the inverting input of the amplifier and comprising a second capacitor, and a third capacitor coupled between the inverting input of the amplifier and the first terminal, said third capacitor having a capacitance which is higher than that of the first capacitor and higher than that of the second capacitor.

4,706,067

SWITCH ACTUATED COMMUNICATION DEVICE

Lane T. Hauck, 5346 Bragg St., San Diego, Calif. 92122

Filed May 15, 1986, Ser. No. 863,339
Int. Cl.[4] G09B *5/36*; H03R *13/00*
U.S. Cl. 340—365 R **15 Claims**



1. A device for generating an output information message in response to a sequence of coded information switch closures, comprising:

single input means for detecting the sequence of switch closures, each of varying duration;

dot feedback means including timing means for generating a

predetermined dot interval when said input means detects a switch closure;

said dot feedback means being responsive to the input means detecting said switch closure for generating a preselected first timing interval following said dot interval;

said dot feedback means including means responsive to said timing means completing said dot interval for generating a human-sensible dot feedback signal to alert an operator that said switch closure has been detected and that the switch closure should be discontinued if a dot signal is intended;

dot generation means responsive to the input means detecting said switch closure being discontinued within said first timing interval, for generating a dot information signal;

dash feedback means responsive to the input means detecting said switch closure that is not discontinued within said first timing interval, for generating a human-sensible dash feedback signal to alert the operator that the switch closure has been of sufficient duration to be decoded as a dash;

dash generation means responsive to the input means detecting said switch closure that is not discontinued within the preselected first timing interval for generating a dash information signal;

silent interval means responsive to the input means detecting said switch closure being discontinued beyond a preselected second time interval, for generating a human sensible end-of-letter signal to alert the operator that the switch has been released long enough for the previous dots and dashes to be decoded into a character;

interdigital silent interval means responsive to said input means detecting another switch closure with said second time interval, to decode a subsequent digit such as a dot or a dash, being initialed by said other switch closure, and the previously decoded digits as being part of a single character information; and

decoding means for converting a coded sequence of dot and dash information signals to an output information message in a desired format.

4,706,068

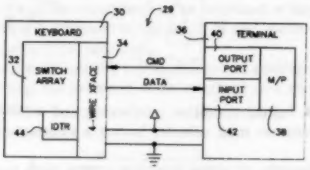
FOUR WIRE KEYBOARD INTERFACE

Martin F. Eberhard, Palo Alto, Calif., assignor to Wyse Technology, Inc., San Jose, Calif.

Filed Jan. 30, 1985, Ser. No. 696,261

Int. Cl.[4] G06F *3/02*

U.S. Cl. 340—365 S **12 Claims**



1. In a computer system comprising a terminal and a keyboard, said terminal comprising a central control means for controlling the operation of said keyboard and said keyboard comprising a switch array having a plurality of rows and a plurality of columns, the improvement wherein:

said terminal further comprises a data output port for transmitting command signals from said central control means and a data input port for receiving a data signal from said keyboard, said terminal commmand signals comprising a keyboard initialize signal and a keyboard increment signal each having a different duration;

said keyboard further comprises a four-wire keyboard interface means for communicating with said terminal, wherein said interface means receives the keyboard initialize signal, initializes the remainder of the keyboard, receives the keyboard increment signal to cause said switch array to be scanned after the receipt of said keyboard initialize signal, said scanning of said switch array being capable of detecting the activation of a location of said switch array after the receipt of said keyboard increment signal, and transmits said data signal after detecting the activation of said location of said switch array,

said four wire keyboard interface means further comprising a row selector means for detecting the row position of said location of said switch array, a column selector means for detecting the column position of said location of said switch array, and a command differentiator means for differentiating said command signal received by said four-wire keyboard interface means, said command differentiator means comprising a signal duration differentiating means being capable of differentiating among said command signals.

4,706,069

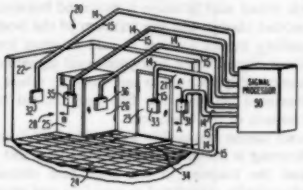
SECURITY SYSTEM

Edward Tom, Philadelphia, Pa., and Douglas E. McGovern, Albuquerque, N. Mex., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 8, 1986, Ser. No. 849,491

Int. Cl.[4] G08B *13/00*

U.S. Cl. 340—541 **10 Claims**



1. A system for sensing activity affecting a secured area or a boundary which defines that secured area, said system comprising:

a transducer including a ferroelectric film of polyvinylidene fluoride (PVDF) with first and second opposed major surfaces having, respectively, first and second electrodes deposited thereon;

said transducer being disposed with its first major surface in acoustic and thermal contact with a portion of said boundary to transduce individual types of thermal and mechanical activity affecting said boundary into electrical signals, each activity of interest being transduced into an electrical signal having a corresponding waveform;

means responsive to the presence of said electrical signals corresponding to said individual activities of interest for separately recognizing the waveforms which correspond to each of at least two different ones of said activities for detecting the occurrence of those at least two different individual activities and for producing an output signal identifying each of said individual activities whose occurrence is detected; and

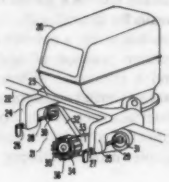
means responsive to said identification signal for generating an alarm signal in response to the identification of specific activities.

4,706,070

OUTBOARD MOTOR ALARM SYSTEM

Steven A. Forti, Norwell, and Robert F. McNulty, Jr., Brewster, both of Mass., assignors to Eclipse Technologies, Norwell, Mass.

Filed Aug. 4, 1986, Ser. No. 892,274
Int. Cl.[4] G08B *21/00, 13/14*
U.S. Cl. 340—568 **20 Claims**



1. An alarm system powered by a portable power source for an outboard motor, said motor having an electrically conductive housing electrically coupled to electrically conductive first and second clamps for mounting the motor to a transom of a boat, said alarm system comprising:

a housing, adapted to be mounted between the first and second clamps of the outboard motor and the transom of the boat, including a first arm portion and a second arm portion:

a first electrically conductive sensor member mounted in said first arm portion and mechanically connectable to the first clamp of the outboard motor;

a second electrically conductive sensor member mounted in said second arm portion and mechanically connectable to the second clamp of the outboard motor;

a compartment in said housing for mounting the portable power source including an electrical connection for the portable power source, said compartment being inaccessible when said housing is mounted between the first and second clamps and the transom of the boat;

signalling means located in said housing for providing an alarm signal when activated, said signalling means being inaccessibly located in said housing when said housing is mounted between the first and second clamps and the transom of the boat; and

circuit means inacessibly located in said housing when said housing is mounted between the first and second clamps and the transom of the boat, said circuit means being electrically connected to said first and second electrically conductive sensor means and to said electrical connection for the portable power source and to said signalling means, said circuit means providing an open circuit detection, whereby when either the first or second clamp of the outboard motor is mechanically backed off, thereby increasing the electrical resistance between the first or second clamp and the respective first or second electrically conductive sensor member, beyond a predetermined range, said signalling means is activated thereby providing the alarm signal.

4,706,071

WARNING APPARATUS AGAINST THE COVERLET OUT OF POSITION

Min-Shin Lin, 116 Yuan tzyy Street, Taichung, Taiwan

Filed Apr. 16, 1986, Ser. No. 852,800
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—568 **1 Claim**

1. A warning apparatus to signal that a coverlet of a bed is out of position, comprising:

a belt;

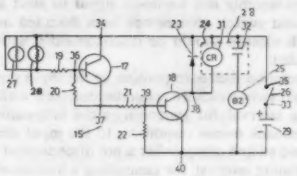
a buckle mounted on one end of said belt;

a rim on said buckle;

a catch mounted on the other end of said belt;

a photo electric circuit means comprising a first photo sensitive element provided on said buckle, and a second photo sensitive element provided on said belt, said first and second photo sensitive elements being separated a predetermined distance and connected in parallel in said photo electric circuit means; and

a buzzer connected to said photo electric circuit means;



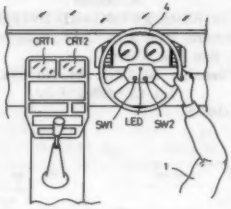
wherein when said belt is buckled about a child in said bed and covered with said coverlet, and when said coverlet is kicked out of position by said child, said buzzer provides said warning as a result of at least one of said photo sensitive elements receiving more light when said coverlet is out of position compared to when it is in position over said child buckled with said belt.

4,706,072

HUMAN CONDITION MONITORING AND SECURITY CONTROLLING APPARATUS ON A ROAD-VEHICLE

Takeshi Ikeyama, Tokyo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Nov. 29, 1984, Ser. No. 676,326
Claims priority, application Japan, Nov. 30, 1983, 58-225794; Nov. 30, 1983, 58-225795; Nov. 30, 1983, 58-225796; Dec. 20, 1983, 58-240530; Dec. 22, 1983, 58-242788; Mar. 13, 1984, 59-48457
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—576 **16 Claims**



1. A human condition monitoring and security controlling apparatus on road vehicles having a steering wheel comprising:

a plurality of status detecting means, each means including an optical sensing means for generating an electric signal in accordance with whether or not said steering wheel of the road vehicle is firmly gripped, said optical status detecting means being disposed on the steering wheel with given intervals therebetween;

detection energizing means for energizing said status detecting means;

signal processing means for processing an electric signal from said status detecting means;

at least one security means carried by the road vehicle; and

electronic control means for monitoring information output from said signal processing means and for energizing said security means if any anomaly occurs wherein said electronic control means sequentially selects said light receiving means, detects differences in output signal level between every adjacent light receiving means, and specifies

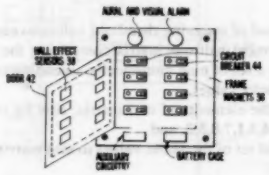
those light receiving means in accordance with said differences.

4,706,073

CIRCUIT BREAKER PANELS WITH ALARM SYSTEM

Oscar Vila Masot, Doral Beach, Complejo Tucistico, "El Morro", Puerto de la Cruz, Venezuela

Continuation-in-part of Ser. No. 654,157, Sep. 25, 1984. This application Jul. 31, 1985, Ser. No. 760,925
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—639 27 Claims



1. An alarm system used in conjunction with a conventional thermoelectrically or magnetically actuated device for sensing the occurrence of an overload condition or a short circuit condition between a line current and a load, said device provided in electrical panel devices, each panel box provided with a movable door and a fixed frame, the system comprising:

a movable switch provided in said thermoelectrically or magnetically actuated device, said movable switch movable from an ON position to a TRIPPED position when said device senses a circuit overload or short circuit condition;

alarm set-reset switch provided in said door and said frame of said electrical panel box, said door provided with a movable contact and said frame provided with a fixed contact engaged by said movable contact when said door is closed;

sensing means provided in proximity with device but physically and electrically disconnected from said device for sensing the actual physical movement of said switch responsive to the occurrence of an overload or short circuit condition as opposed to the result of said movement such as noise or vibration; and

alarm means electrically connected to said sensing means for indicating the presence of an overload in a short circuit condition.

4,706,074

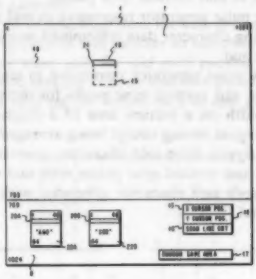
CURSOR CIRCUIT FOR A DUAL PORT MEMORY

John S. Muhich, Austin, and Joseph S. Thornley, Round Rock, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 17, 1986, Ser. No. 820,467
Int. Cl.[4] G06F *3/153*
U.S. Cl. 340—709 10 Claims

1. A cursor generation circuit for an image display system, said circuit comprising:

means for storing image data representing a visual image and including a first port to provide read/write access to said image data to a means for generating said image data and a second port to provide read/write access to said image data to a means for providing a display of said visual image; and



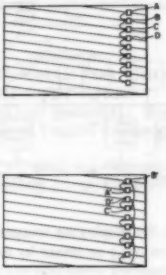
means for combining said image data with cursor data in said storing means during access through said second port.

4,706,075

CIRCUIT ARRANGEMENT AND METHOD FOR MOVING CHARACTERS SUPERIMPOSED ON AN IMAGE REPRESENTED BY A VIDEO SIGNAL

Hiroyuki Hattori, Kawasaki, and Akiyoshi Morita, Sagamihara, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Jul. 9, 1984, Ser. No. 629,088
Claims priority, application Japan, Jul. 8, 1983, 58-124123
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—726 12 Claims



1. A circuit arrangement for moving characters superimposed on an image represented by a video signal to be fed to an interlacing CRT, for use with a character signal mixing circuit which produces a composite video signal having horizontal and vertical sync pulses, said circuit arrangement comprising:

(a) an odd-field detecting means responsive to said composite video signal for producing output pulses by detecting odd fields;

(b) means responsive to said odd-field detecting means, said vertical sync pulses and said horizontal sync pulses for providing said horizontal sync pulses in such a manner that the number of said horizontal sync pulses is reduced by the number of detected odd fields, and for producing a return pulse, said horizontal sync pulses being provided in response to said vertical sync pulse when the number of said horizontal sync pulses equals a number determined by the number of said detected odd-fields, and said return pulse being produced when a predetermined number of said odd fields are detected;

(c) a memory in which character data is stored;

(d) a character generator for receiving said character data

from said memory so as to supply said mixing circuit with character signals in response to said horizontal sync pulses fed from said means responsive to said odd-field detecting means and to said vertical sync pulses;

(e) a rewrite pulse generator responsive to said return pulse for rewriting character data transmitted to said character generator; and

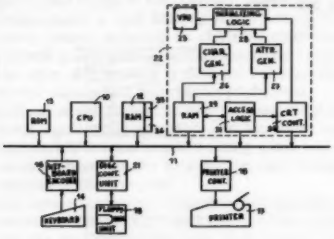
(f) a window pulse generator responsive to said horizontal sync pulses and vertical sync pulses for determining displaying width on a picture area of a display unit, said character signal mixing circuit being arranged to mix said character signals from said character generator and said horizontal and vertical sync pulses with said video signal and to supply said character generator with a resultant mixed signal.

4,706,076

APPARATUS FOR DISPLAYING IMAGES DEFINED BY A PLURALITY OF LINES OF DATA

Loriano Racchini, Turin, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Sep. 17, 1984, Ser. No. 651,318
Claims priority, application Italy, Sep. 30, 1983, 68005 A/83
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—726 **7 Claims**



1. An apparatus for displaying images comprising a visual display unit for producing an image by means of a raster scan, a page memory for storing a plurality of rows of data, each row representing a corresponding strip of said image, and means responsive to the data so stored for generating video signals in synchronism with the display unit scanning lines, said generating means generating a group of successive dot video line signals from each stored row of data, wherein the improvement includes:

a pair of auxiliary memories individually conditionable for storing for each scanning line of the raster scan the address in the page memory of the row of data representing said strip of image, control means effective during one raster scan of said display unit for alternatively reading one of said auxiliary memories to sequentially address said page memory and for simultaneously conditioning the other one of said auxiliary memories to store the addresses of rows of data in the page memory to be displayed during the next following raster scan, and settable means for selecting a part of said other auxiliary memory and for storing therein the addresses of the page memory corresponding to at least a group of consecutive scanning lines shifted one scanning line in a selected direction with respect to those stored in the auxiliary memory being read.

4,706,077

HALFTONING IMPLEMENTATION FOR INTERACTIVE IMAGE EDITING

Allen M. Roberts, Manhattan Beach; Andrew Sangster, Redondo Beach, and Zoltan Stroll, Rancho Palos Verdes, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 8, 1981, Ser. No. 300,349
Int. Cl.[4] G09G *1/00, 3/00*
U.S. Cl. 340—728 **10 Claims**

6	9	4
3	1	7
8	5	2

1. The method of assigning threshold values to each element of a 3 by 3 element halftone matrix comprising the steps of:

determining a set of nine numerically ascending or descending threshold values,

numbering the elements of said matrix, row by row, as follows: **6,9,4,3,1,7,8,5,2**, and

assigning said set of threshold values to said matrix in numerical order.

4,706,078

APPARATUS FOR DISPLAYING THE LAYOUT OF TEXT

Shinichi Kimura, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1984, Ser. No. 640,741
Claims priority, application Japan, Aug. 18, 1983, 58-149675
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—735 **14 Claims**

CHARACTER IN TEXT	ENGLISH UPPER CASE	ENGLISH LOWER CASE	NUMERAL	SYMBOL	BLANK
DISPLAY SYMBOL ON LAY-OUT DISPLAY	■	◘	▬	▮	▦

1. Electronic text preparing apparatus comprising:

memory means for storing text containing plural lines of characters, each character having one of at least two different characteristics, at least one of said characteristics being common to at least two different characters;

discrimination means for detecting a selected characteristic of each character in said plural lines of characters stored in said memory means;

pattern memory means for storing patterns, each pattern corresponding to one of the respective characteristics of the characters detected by said discrimination means;

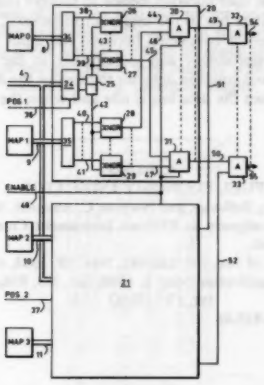
conversion means for converting each character of said plural lines of characters, which are stored in said memory means, into one of said patterns stored in said pattern memory means, according to the characteristic detected by said discrimination means; and

display means, responsive to said conversion means, for displaying said patterns.

4,706,079
RASTER SCAN DIGITAL DISPLAY SYSTEM WITH DIGITAL COMPARATOR MEANS

David A. Kummer, Boca Raton; Jesus A. Saenz, Coral Springs, and Stephen W. Trynosky, Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 16, 1983, Ser. No. 523,916
Int. Cl.[4] G09G 1/16
U.S. Cl. 340—799 5 Claims



1. A rather scan digital display system including an even number, n, of bit map memories, means for simultaneously retrieving data from corresponding locations in each of the bit map memories in parallel groups of m bits, means for serializing the groups to form serial streams of parallel n bit picture element (pel) defining groups, and a compare system for comparing said retrieving data with an n bit compare data group prior to serialization to detect equality between each bit of the compare group and corresponding bits of the retrieved data groups defining individual pels, said compare system comprising n stage register means for registering said n bit compare data group, n groups of m exclusive NOR circuits, each exclusive NOR circuit in a group having a first and a second input and an output, said first input being coupled to receive a respective bit of each retrieved data group from a bit map memory uniquely associated with the exclusive NOR circuit group, said second input being coupled together with second inputs of all the exclusive NOR circuits in the circuit group to a corresponding single stage of said register means, said compare system further including for individual pairs of groups exclusive NOR circuits, a group of m AND circuits each having first and second inputs coupled respectively to the outputs of corresponding exclusive NOR circuits in the corresponding pair of groups, and an output providing signals indicating correspondence between corresponding bits in retrieved data groups from the associated bit map memories and the corresponding compare data bits.

4,706,080
INTERCONNECTION OF BROADCAST NETWORKS

Walter D. Sincoskie, Union Township, Union County, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Aug. 26, 1985, Ser. No. 769,555
Int. Cl.[4] G08B 5/00; H04Q 5/00; H04J 3/24
U.S. Cl. 340—825.02 6 Claims

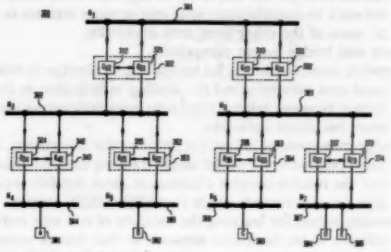
1. A method for transmitting packets over a system comprising a plurality of networks interconnected by gateways, each of said packets having a sending address and a destination address, said method characterized by the steps of

configuring each of said gateways to implement the routing algorithm of forwarding any of said packets received by said each gateway except for said any of said packets destined for one of said networks having a sending address appearing in any previously counted ones of said packets, said sending appearances being stored in a drop list within said each gateway.

selecting a set of spanning trees for said system,

conveying by each of said packets an identifier indicative of one of said trees, and, for said each packet,

extracting said sending address and said destination address from said each packet within each of said gateways,



if said sending address is not in said drop list of said each gateway, adding said sending address to said drop list,

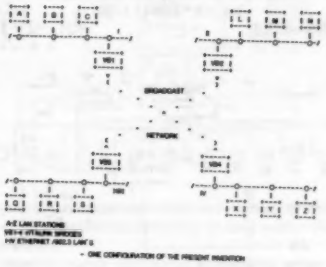
if said destination address is not in said drop list, storing said each packet for a predetermined time interval wherein subsequent ones of said packets are processed by said each gateway, and

routing of said each packet by said gateways through said system on one of said spanning trees in correspondence with said identifier whenever said destination address is not in said drop list after said time interval; otherwise, no longer storing said each packet within said each gateway.

4,706,081
METHOD AND APPARATUS FOR BRIDGING LOCAL AREA NETWORKS

John H. Hart, Campbell, and Frederick J. Baker, Santa Clara, both of Calif., assignors to Vitalink Communications Corporation, Fremont, Calif.

Filed Dec. 14, 1984, Ser. No. 682,061
Int. Cl.[4] H04Q 11/04; H04J 3/00
U.S. Cl. 340—825.03 19 Claims



1. A communications system for interconnecting multiple local area networks across backbone networks independently and transparently of protocols above the data link layer and so that the multiple local area networks appear to the users of stations of all local area networks as one large single local area network, said system comprising,

a plurality of local area networks with each local area net-

work having at least one station for sending or receiving communications to or from another station using data link frames containing at least a destination address and a source address,

at least one backbone network comprising only simplex broadcast channels and connecting two or more local area networks and wherein each backbone network has one and only one transmit simplex channel associated with one or more receive simplex channels,

a plurality of bridge means with each bridge means interconnecting across simplex channels a plurality of local area networks to permit one or more stations in one local area network to communicate with one or more stations in one or more of the other local area networks,

each said bridge means comprising,

network interface means for interfacing the bridge to related local area networks and for sending information in frame format between related local area networks across one or more backbone networks,

bridge management means for defining the association, in a backbone network, of the single transmit simplex channel and the receive simplex channels in three possible topologies, i.e. non-rooted, single rooted and multi rooted,

learning means for learning the location of end user stations relative to the backbone network so that frames received from the backbone network can be forwarded or discarded,

forwarding means for forwarding a frame received from one station in one local area network to a designated station in another local area network across one or more backbone networks independently and transparently of protocols above the data link layer,

discarding means associated with each receive simplex channel for selectively discarding frames,

wherein the transmit simplex channel characteristics are completely independent of receive simplex channel characteristics and the characteristics of each individual receive simplex channel are independent of other receive simplex channel characteristics, and

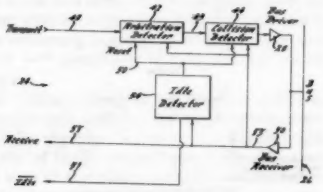
wherein the backbone network is not required to be related to the local area network access technique or bandwidth.

4,706,082

SERIAL DATA BUS FOR INTERMODULE DATA COMMUNICATIONS

Frederick O. R. Miesterfeld, Troy; Ronald E. Fassnacht, Rochester, and John M. McCambridge, Northville, all of Mich., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Feb. 24, 1986, Ser. No. 832,908
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.5 **2 Claims**



1. A communication system for the transmission of data messages through a data bus between two or more user microprocessors coupled to the data bus, the user microprocessors having a serial communications interface (SCI) port along with a clock port and an input/output port, the user microprocessors being coupled to the data bus by a bus interface integrated circuit, the bus interface integrated circuit comprising:

an arbitration detector;

a collision detector;

a bus driver;

a bus receiver;

and an idle detector;

a series circuit formed by the connection of the arbitration detector, collision detector and bus driver connected between the SCI port of the user microprocessor and the data bus to transmit data from the user microprocessor to the data bus;

the bus receiver connected between the data bus and the SCI port of the user microprocessor to receive data messages from the data bus to the user microprocessor;

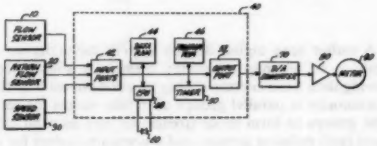
the idle detector connected between the input port of the user microprocessor and individually to the arbitration detector and collision detector to monitor the data bus and detect when the data bus is idle and when the data bus is busy.

4,706,083

FUEL ECONOMY INDICATOR

Wilfried Baatz, Bellevue, and Norman C. Ahlquist, Seattle, both of Wash., assignors to FloScan Instrument Company, Inc., Seattle, Wash.

Continuation of Ser. No. 553,082, Nov. 18, 1983, abandoned.
This application May 2, 1986, Ser. No. 858,879
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.06 **14 Claims**



1. An indicator for a vehicle having a liquid fuel consuming engine for indicating the relative rate at which the vehicle is consuming fuel, comprising:

sensor means for producing electrical signals indicative of the vehicle's fuel consumption and distance traveled;

electronic processing means responsive to said signals for producing an output signal indicative of the ratio of the instantaneous rate of fuel consumed per distance traveled to the average rate of fuel consumed per distance traveled; and

display means for displaying said output signal.

4,706,084

CODED KEY-TYPE LOCKING SYSTEM

Pierre Meyers, Nimrodstr. 7, D-8012 Ottobrunn, and Klaus Meister, Am Fischerwinkel 3, D-8022 Grünwald, both of Fed. Rep. of Germany

Filed Oct. 3, 1985, Ser. No. 783,485
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1984, 3437030
Int. Cl.[4] H04Q *1/00*
U.S. Cl. 340—825.31 **8 Claims**

1. A locking system comprising:

a key having a conductive carrier,

an insulating base on said carrier;

at least one first conductive strip, on said insulating base,

means for connecting said first conductive strip to said carrier;

at least one further second conductive strip on said insulating base;

an insulating layer covering said first conductive strip and said second conductive strip, said insulating layer formed with a plurality of windows which are each

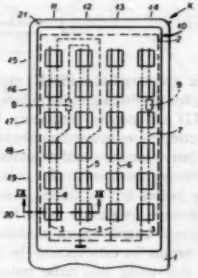
traversed by said first conducting strip and said second conducting strip, and

a coating layer which selectively insulates each window by either insulating the first conductive strip in a first information mode or the second conductive strip in a second information mode or the entire window in a third information mode so as to code each of said windows with an information code formed from a group of at least three of said information modes;

a reader cooperating with said key and provided with:

a reading set of first contacts coming into electrical contact with said strips through said windows during insertion of said key into said reader for detecting the selective insulation of the strips of said windows,

a coding set of second contacts arranged in an arbitrary manner and quantity at least some of which are electrically connected to a potential supply, said second



contacts being electrically connected to uninsulated strips of selected ones of said windows in accordance with said information code during insertion of said key in said reader, and

a potential supply contact connected to said supply and engageable with said carrier for applying an electrical potential to said carrier and to said first conductive strip enabling said reading set of first contacts to read said contained information code from said key in the form of electrical potentials detected by said reading set of first contacts; and

electronic means operatively connected to said reader and responsive to the electrical potentials detected by said reading set of first contacts for operating a lock depending upon correctness of the code represented by the arbitrary arrangement of said coding set of second contacts and the information code of the key.

4,706,085

APPARATUS AND METHOD FOR GENERATING MULTI-DIGIT CODES

Yoshihisa Kudo, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 27, 1984, Ser. No. 625,048

Claims priority, application Japan, Jun. 30, 1983, 58-101842[U]

Int. Cl.⁴ H04Q *7/00*; G08B *5/22*

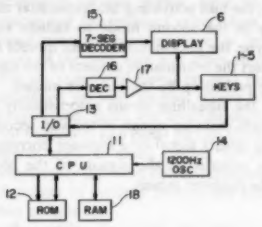
U.S. Cl. 342—825.56 **4 Claims**

1. A radio apparatus having a code generating circuit including a manual keypad for keying numericl data, and write and read function keys, said apparatus comprising:

display means having a plurality of successive digit positions;

read-write memory means; and

data processing means for storing keyed numerical data representing part of a multi-digit destination code into a storage location in said memory means in response to operation of said write function key, storing keyed numerical data representing an address of said storage location, reading the stored part of said destination code data in response to successive operations of said read function key and said keypad keying of numerical data representing said address, and appending an additional digit to said part of said destination code read out of said memory means to complete said destination code in response to a subsequent operation of said keypad keying of numerical data representing said additional digit, said data processing means being programmed to perform the steps of:



(a) shifting the digit positions of said part of said destination code by one digit in response to an operation of said keypad keying of numerical data representing each of the digits of said destination code;

(b) loading said part of said destination code into said display means so that one of the most significant digit positions of said display means is left vacant; and

(c) loading said additional digit into the vacant one of the most significant digit positions.

4,706,086

SYSTEM FOR COMMUNICATION AND AUTOMATIC SIGNALLING BETWEEN A PLURALITY OF MOTOR VEHICLES

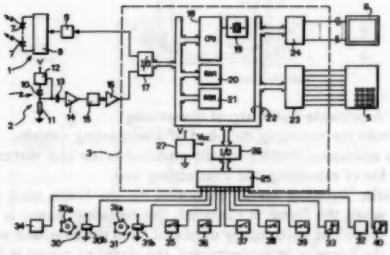
Ettore Panizza, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed May 2, 1986, Ser. No. 858,770

Claims priority, application Italy, May 6, 1985, 67412 A/85

Int. Cl.⁴ G08G *1/00*; B60Q *1/00*

U.S. Cl. 340—902 **24 Claims**



1. A system for communication and signalling between a plurality of motor vehicles including in each motor vehicle of the said plurality:

signal receiver means and signal transmitter means for receiving and transmitting electromagnetic or pressure waves respectively;

detector means for outputting electrical signals indicative of predetermined travelling conditions of the motor vehicle;

electric control and signalling means for providing the user with perceptible messages or signals; and

an electrical processing and control unit connected to the receiver and transmitter means to the detector means and

to the signalling means; the processing and control unit being arranged to assume automatically

(i) a first mode of operation when the detector means indicate the occurence of one of the said travelling conditions; the unit activating the transmitter means automatically in the said first mode of operation to radiate signals of a first type containing information indicative of the detected travelling conditions,

(ii) a second mode of operation when the receiver means picks up signals of the first type transmitted by the transmitter means of another motor vehicle of the said plurality; the unit activating the transmitter means automatically in the second mode to radiate signals of a second type, the information content thereof includes at least in part the information content of the signals of the first type picked-up by the receiver means;

and to activate the signalling means automatically each time the receiver means picks up signals of the said second type, to provide the user with a signal or a message corresponding to the information content of the signals of the second type picked up by the receiver means.

4,706,087

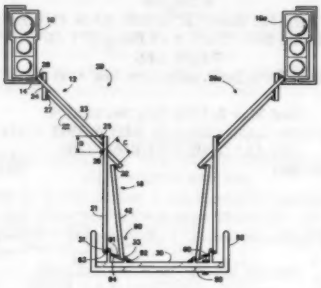
PORTABLE TRAFFIC SIGNAL

Melvin A. Holznagel, Rte. 4, Box 273A, Sherwood, Oreg. 97140

Filed Jan. 24, 1985, Ser. No. 694,465

Int. Cl.[4] G08G *1/095*

U.S. Cl. 340—908 **12 Claims**



1. A portable traffic signal comprising:

a base for mounting on a bed of a supporting vehicle,

an articulated frame pivotally attached to the base and capable of extending and contracting, and

traffic signaling means supported by the frame such that when the frame is extended, the signaling means is elevated and horizontally displaced from the base, and when the frame is fully contracted, the signaling means is lowered and positioned above the base,

wherein the articulated frame comprises an articulated parallelogram having sides defined by a first, a second, a third and a fourth structural member, and an articulated quadrangle being other than a parallelogram having adjacent sides defined by the first and second structural members, and a third side defined by a fifth structural member, the first and fifth structural members having ends pivotally attached to the base,

the quadrangle having a fourth side being defined by a line extending between the points of attachment to the base of the first and fifth structural members.

4,706,088

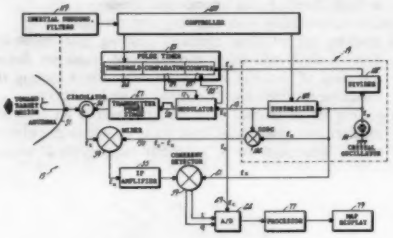
SYNTHETIC APERTURE RADAR FOCUSING

Frederik Weindling, Norwalk, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 24, 1986, Ser. No. 842,961

Int. Cl.[4] G01S *13/90*

U.S. Cl. 342—25 **3 Claims**



1. In a synthetic aperture radar (SAR) system mounted on a moving platform, for producing radar pulses at a variable pulse rate interval (PRI) and carrier frequency, said SAR system effective for directing them toward a selected target region of predetermined relative location and dimensions, a pulse generator system comprising timer means for controlling the time at which said radar pulses are produced, frequency means for establishing a reference frequency value for comparison with radar return from said target region, modulator means responsive to said timer means for establishing the pulse width of said radar pulses and delivering said radar pulses to a transmitter power stage, said SAR system characterized in that it further includes control means for directing said timer means in modifying the time of production of said radar pulses by varying the PRI and for directing said frequency means controllably to vary said reference frequency to ensure that at least three independent points in said target region are maintained in focus.

4,706,089

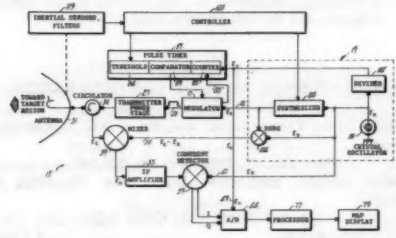
SYNTHETIC APERTURE RADAR FOCUSING

Frederik Weindling, Norwalk, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 24, 1986, Ser. No. 842,951

Int. Cl.[4] G01S *13/90*

U.S. Cl. 342—25 **3 Claims**



1. In a synthetic aperture radar (SAR) system mounted on a moving platform for producing radar pulses at a selected pulse rate interval (PRI) and variable carrier frequency, said SAR system effective for and directing them toward a selected target region of predetermined dimensions, a pulse generator system comrpising timer means for establishing the time at which said radar pulses are produced, frequency means for establishing a reference frequency value for comparison with radar return from said target region; modulator means respon-

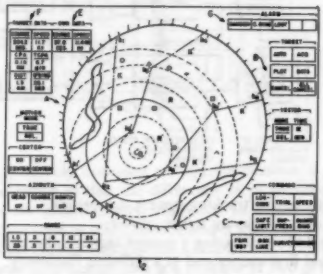
sive to said timer and frequency means, for establishing the pulse width of said radar pulses and delivering said radar pulses to a transmitter power stage, said SAR system characterized in that it further includes control means for directing said frequency means to vary said reference frequency to ensure that two independently specified points in said mapped region are maintained in focus.

4,706,090

SHIP COLLISION PREVENTIVE AID APPARATUS

Shinji Hashiguchi, Suita; Hisayuki Kimata, Nara, and Yukuo Koga, Tokyo, all of Japan, assignors to Hitachi Zosen Corp and Kabushiki Kaisha Koden Seisakusho, both of, Japan

Filed Jan. 22, 1985, Ser. No. 693,099
Claims priority, application Japan, Jan. 27, 1984, 59-14046
Int. Cl.[4] G01S *7/22*; G06F *15/50*
U.S. Cl. 342—41 **2 Claims**



1. A ship collision preventive aid apparatus comprising:

(1) a color cathode ray tube including a display screen for displaying the following pictures:

(i) a radar picture displayed on said display screen at the center thereof on which figures including arrows, circles, straight lines, and squares are overlapping displayed;

(ii)

(a) a first key picture for a command for automatic catching of either one or a combination of targets, including a designated target, wake display, or cancellation of a designated target,

(b) a second key picture for calling a command for setting either a guard zone, a suppress zone, or a fairway,

(c) a third key picture for either switching an ON-center/OFF-center of a bearing scale, selecting a bearing mode, or switching a display range,

said pictures (a), (b) and (c) being displayed on said display screen at a portion of the periphery thereof,

(iii) own ship data and other ship data displayed on said display screen at a different part of the periphery thereof,

(iv) alarm marks for informing the operator of the entrance of other ships either in or entering into the guard zone or error, said alarm marks being displayed on said display screen at a still different part of the periphery thereof,

(2) a touch panel for supplying position signals representing contact points on said panels contacted by the operator, said touch panel overlapping disposed on the display screen of said cathode-ray tube and transmitting pictures displayed on said display screen;

(3) a forming means for forming, based on said position signals, the coordinates of selected points on said display screen corresponding to said contact points on said panel;

(4) a judging means for judging, by output signals form said forming means, that the picture including the coordinates of said selected points is any of said key pictures, said radar picture or other picture than said key pictures and said radar picture,

(5) a processing means for executing predetermined programs, based on output signals from said judging means, thereby to perform the operations as follows:

(i) when said first or second key picture and the radar picture are continuously selected,

(a) a program corresponding to said first or second key picture selected is executed to overlappingly display, on said radar picture, predetermined ship collision preventive aid data such as cross marks representing designated targets which have been caught, the course and the wake of other ships designated, the guard zone, the suppress zone, or the fairway,

(b) data of the own ship and other ships caught as targets are computed based on said radar picture and displayed on said display screen at the periphery thereof, and there are overlappingly displayed, on that portion of said radar picture showing other ships, figures such as small circles, or small squares, in respectively different colors dependent on the degree of danger of collison determined based on the data thus computed,

(c) when setting the guard zone, the suppress zone, the fairway or the like, said second key picture being temporarily changed to a setting command key picture for the guard ring, the suppress zone, or the fairway,

(ii) when said third key picture is selected, the program corresponding to said third key picture is executed for carrying out the operations including the display of the ON-center/OFF-center of said radar picture, the display of the head-up, the display of the north-up, the switching of the display range, and

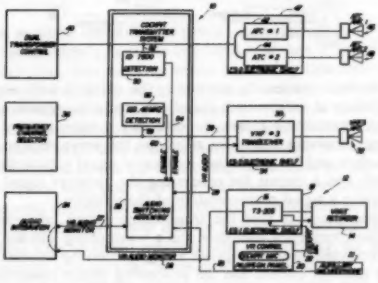
(iii) when a picture other than any of said key pictures and said radar picture is selected, there is displayed an alarm mark informing the operator of the occurrence of an error, on said display screen at the periphery thereof.

4,706,091

COCKPIT TRANSMISSION ASSEMBLY

George M. Scott, 9494 SW. 144 St., Miami, Fla. 33176

Filed Apr. 7, 1986, Ser. No. 849,216
Int. Cl.[4] G01S *13/80*
U.S. Cl. 342—42 **19 Claims**



1. In a transmission system of the type designed to discretely transmit conversation from a cockpit of an aircraft of the commercial type wherein the aircraft includes transponder means for identifying individual aircraft to ground tracking stations, radio transceiver means capable of transmitting audio signals to the ground stations and a voice recorder means for recording sound from a cockpit microphone of voices emanating from within the cockpit, an improvement comprising:

(a) audio integration means interconnected to said voice

recorder means and structured for receiving audio signals therefrom,

(b) a first audio monitor connection between said voice recorder means and said audio integration means and structured to transmit audio signals received by said voice recorder means to said audio integration means,

(c) an audio switching assembly interconnected to said audio integration means by a second audio monitor structure and to said radio transceiver means for the regulated transmission of audio signals thereto,

(d) said audio switch assembly structured to regulate transfer of audio signals from said audio integration means to said radio transceiver means and accomplish such transfer of the audio signals upon activation of said audio switching assembly,

(e) activation means interconnected between at least one of said transponder means or said radio transceiver means and said audio switching assembly for activation thereof, said activation means structured to signal said audio switching assembly upon assuming an operative mode, and

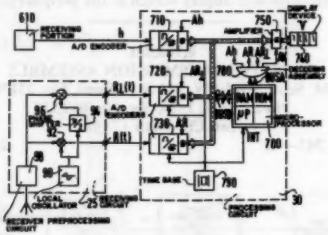
(f) said audio switching assembly when activated by said activation means directs audio signals representative of all cockpit conversation received by said voice recorder means to said radio transceiver means for transmission of the received audio signals to a ground tracking station.

4,706,092

ARRANGEMENT FOR MEASURING VELOCITY WITH RESPECT TO A SURFACE

Francois Magne, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 6, 1986, Ser. No. 836,918
Claims priority, application France, Mar. 29, 1985, 85 04823
Int. Cl.[4] G01S *13/58*
U.S. Cl. 342—109 **12 Claims**



1. An arrangement for measuring the velocity with respect to a surface at a distance h therefrom, said arrangement comprising transmitting means for directing a wave toward the surface, receiving means for receiving the wave returned by the surface and for producing a receiver signal representative thereof, and a circuit for processing the receiver signal and producing a signal representative of the velocity,

characterized in that the transmitting means comprises a fixed frequency oscillator and a transmitting antenna, the receiving means comprises a single receiving antenna and a receiver circuit, and the processing circuit comprises:

(a) a multiplying member having first and second inputs and an output;

(b) first and second signal-carrying branches electrically connected to the receiving means, the first branch comprising a direct branch for applying the receiver signal to the first input of the multiplier member and the second branch comprising a delaying branch for applying the receiver signal to the second input of the multiplying member after having been subject to a delay t_0 relative to the direct branch;

(c) a member electrically connected to the output of the multiplying member for estimating the frequency of the multiplying member output signal; and

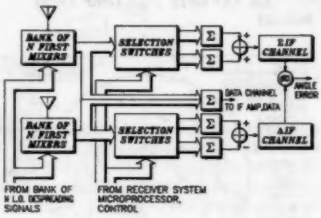
(d) a calculating member electrically connected to the estimating member for producing the signal representative of the velocity and the distance h.

4,706,093

MONOPULSE TRACKING SYSTEM SUBSTANTIALLY FREE OF EXTERNALLY GENERATED NOISE

Edward J. Groth, Jr., Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 26, 1984, Ser. No. 593,150
Int. Cl.[4] G01S *5/02*
U.S. Cl. 342—427 **4 Claims**



1. A monopulse tracking system comprising:

a first channel having a first carrier;

a second channel having a second carrier coherently related to said first carrier and at a different frequency;

monopulse antenna means for receiving first and second signals transmitted at the first and second carriers, respectively;

first means coupled to said first channel and to said monopulse antenna for receiving the first signal and providing a sum signal therefrom;

second means coupled to said second channel and to said monopulse antenna for receiving the second signal and providing a different signal therefrom;

means for supplying a different despreading function to each of said first and second channels; and

a phase detector coupled to said first and second means to receive the sum and difference signals and provide an error signal substantially free of biases due to externally generated noise correlating in the first and second channels.

4,706,094

ELECTRO-OPTIC BEAM SCANNER

Frederick Kubick, Redding, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 3, 1985, Ser. No. 730,401
Int. Cl.[4] H01Q *19/06, 15/02*
U.S. Cl. 343—754 **4 Claims**

1. A millimeter wavelength scanner in the path of millimeter wavelength radiation for modifying the direction of a beam of millimeter wavelength radiation passing therethrough and comprising a block of ferroelectric material with parallel input and output sides generally perpendicular with respect to the path of said millimeter wavelength radiation;

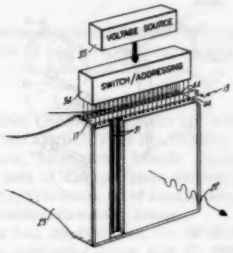
electrode means, disposed on opposite surfaces of said block of ferroelectric material, for progressively varying the refractive index of said ferroelectric material along a predetermined axis; and thereby impressing a phase change on said radiation passing therethrough and

controlling means for establishing a predetermined distribution of voltage on said electrode means to vary said refractive index in a predetermined manner, characterized in that:

said electrode means includes first and second pluralities of

parallel wires disposed on said opposite surfaces perpendicular to said axis;

said controlling means includes means for setting up at least two zones of adjacent wires in said electrode means with at least one transition zone therebetween and for impressing upon said at least two zones of wires a progressively changing voltage distribution corresponding to a desired phase change distribution impressed upon electromagnetic radiation traveling through said ferroelectric material; and



said progressively changing voltage distribution is further characterized in that the difference in phase change between the phase change impressed in a first side of a transition zone in a first zone of said at least two zones and the phase change impressed in a second side of said transition zone in a second zone is a multiple of two pi radians, whereby said phase changes imposed on said electromagnetic radiation in said first and second zones reinforce.

4,706,095

PORTABLE THERMAL LABEL PRINTER

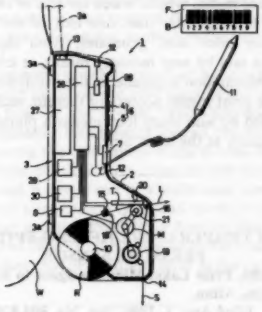
Tsutomu Ono, Iwateken, and Tadao Kashiwaba, Iwate, both of Japan, assignors to Kabushiki Kaisha Sato, Japan

Filed Jun. 17, 1986, Ser. No. 875,277

Claims priority, application Japan, Jun. 26, 1985, 60-137858

Int. Cl.[4] G01D *15/10;* **B65C** *9/18;* **B41J** *3/20;* **G06K** *19/00*

U.S. Cl. 346—76 PH **6 Claims**



1. A portable thermal label printer, comprising:

a label printer unit having data memory means for storing data therein, a program memory means for storing a sequence of instructions therein, an input/output means for providing data communication with other device external to said label printer unit, and control means connected to said data memory means, said program memory means and said input/output means for controlling the above mentioned means of said label printer unit;

a label strip transport for transporting a strip of labels and a support member for supporting a roll of the strip of labels in said label printer unit;

a thermal label printer disposed in said label printer unit for printing information on the strip of labels, said thermal label printer having a thermal print head and wire means for connecting said thermal print head to said control means and further having a heating surface on one side thereof, said label strip transport being effective to transport the strip of labels in a non-intersecting relationship with said wire means, said support for the roll of the strip of labels being positioned such that when the roll is inserted into the label printer unit the entire roll is disposed to the side of said thermal print head which contains said heating surface; and

means for carrying said label printer unit about the body of an operator in a manner that the label printer unit moves with the operator and is operable without being supported by any hand of the operator.

4,706,096

UNIT TYPE THERMAL LABEL PRINTER

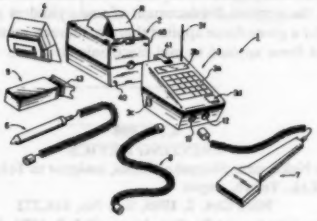
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato, Japan

Filed Jun. 17, 1986, Ser. No. 875,278

Claims priority, application Japan, Jun. 26, 1985, 60-137859

Int. Cl.[4] G01D *15/10;* **B65C** *9/18;* **B41J** *3/20;* **G06K** *19/00*

U.S. Cl. 346—76 PH **14 Claims**



1. A modular thermal label printer, comprising:

an independently operable and hand held data terminal unit including data memory means for storing data therein, a program memory means for storing a sequence of instructions therein and an input/output means for providing data communication with other devices external to said data terminal unit, control means connected to the above mentioned means for controlling said means of said data terminal unit, said data terminal unit being effective for storing therein information that is to be printed on labels;

a hand held label printer unit for printing on thermal labels;

a label strip transport means, in the label printer, for transporting a strip of the labels past said printer unit;

electrical connection means, disposed on both said label printer unit and said data terminal unit, for connecting the data terminal unit and the label printer unit to one another; and

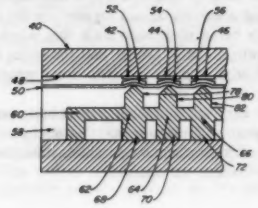
mechanical connection means, disposed on both said label printer unit and said data terminal unit, for enabling the data terminal unit and the label printer unit to be selectively and directly, mechanically interconnected with one another in a manner which combines the label printer unit and the data terminal unit into a single, integrated and hand held label printer.

4,706,097

NEAR-LINEAR SPRING CONNECT STRUCTURE FOR FLEXIBLE INTERCONNECT CIRCUITS

John P. Harmon, Vancouver, Wash., assignor to Hewlett Packard Company, Palo Alto, Calif.

Filed Apr. 3, 1986, Ser. No. 848,366
Int. Cl.[4] G01D 15/24
U.S. Cl. 346—139 C 4 Claims



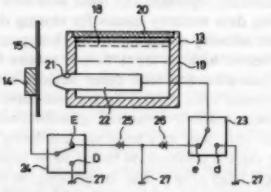
1. A near-linear spring connect structure comprising: a horizontal central locating member and a plurality of resilient cylinders extending integrally therethrough or therefrom a predetermined distance from the major surfaces of said central locating member, said cylinders spaced laterally apart by predetermined distances corresponding to predetermined dimensions on a flexible interconnect circuit at which electrical contact areas are located, whereby tips of said cylinders may be brought into forcible contact with said interconnect circuit to urge said interconnect circuit into electrical contact with another aligned electronic structure, and the volume displacement within said cylinders as a result of force being applied thereto is nearly linear with respect to said force and thereby enables the vertical displacement of said cylinders to be maximized for a given force applied thereto, thereby minimizing the required force applied to said electronic structure.

4,706,098

PRINTING DEVICE

Tetsuro Nakayama, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1986, Ser. No. 914,272
Claims priority, application Japan, Oct. 8, 1985, 60-223925
Int. Cl.[4] G01D 15/16
U.S. Cl. 346—140 R 7 Claims



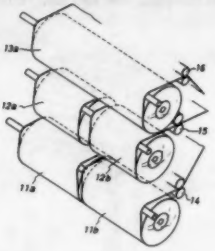
1. In a printing device including a conductive recording electrode having a front end portion to which ink is supplied, and an opposite electrode arranged in opposed relation to said recording electrode with a recording medium interposed therebetween, wherein said ink supplied to the front end portion of said recording electrode is splashed toward said opposite electrode by an electric field created between said opposite electrode and said recording electrode; the improvement comprising switch means for conditioning said recording electrode and said opposite electrode at an earth potential under a non-printing or a print waiting condition.

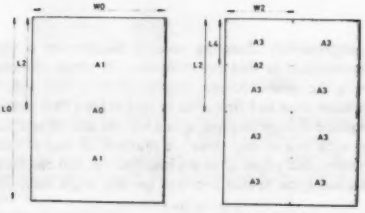
4,706,099

LASER BEAM IMAGE PRINTING DEVICE WITH MULTIPLE SHEET SIZE FEEDING MECHANISM

Shigeru Suzuki, Yokohama, Japan, assignor to Ricoh Corporation, Tokyo, Japan

Filed Aug. 7, 1986, Ser. No. 894,133
Claims priority, application Japan, Aug. 10, 1985, 60-176101
Int. Cl.[4] B06K 15/16
U.S. Cl. 346—160 11 Claims





1. An image printing device which comprises:
(a) a line print means which scans across the whole width of the maximum print size,
(b) a bit map memory means which memorizes the information to be printed, in an amount sufficient to store the data at every dot throughout the entire maximum print size,
(c) a sheet feed means which supplies printing sheet to said line print means, and
(d) a control means which, when the size of the image to be printed is no greater than one half of the width of the maximum print size, generates, from the information stored in said bit map memory means, at least two sets of image information in parallel in the width direction, drives said line print means according thereto, and prints on the sheets fed by said sheet feed means a plurality of images substantially at the same time.

4,706,100

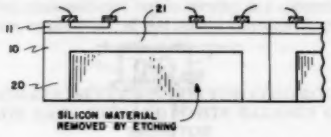
HIGH TEMPERATURE HETERO-EPITAXIAL PRESSURE SENSOR

Obert N. Tufte, Prior Lake, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 1, 1986, Ser. No. 891,829
Int. Cl.[4] H01L 29/161
U.S. Cl. 357—16 10 Claims

1. A high temperature hetero-epitaxial piezoresistive pressure sensor comprising:
a single crystal silicon substrate, the silicon having a bandgap of about 1 eV;
a thin-film epitaxial single crystal layer comprised of a wider bandgap semiconductor than said silicon substrate epitaxially grown on said silicon substrate, said semiconductor also being of a type having large piezoresistive effects;

diffused or ion implanted piezoresistive resistors in said wider bandgap semiconductor layer; and,



a cup like depression in said substrate forming a diaphragm at the location of said piezoresistive resistors.

4,706,101

LIGHT EMITTING DIODE FORMED OF A COMPOUND SEMICONDUCTOR MATERIAL

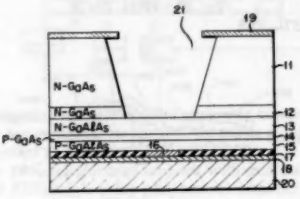
Masaru Nakamura, Kawaguchi; Masaki Okajima; Tadashi Komatsubara, both of Tokyo; Tetsuo Sadamasa, Chigasaki, and Koichi Nitta, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 20, 1985, Ser. No. 767,425

Claims priority, application Japan, Oct. 27, 1984, 59-226154; Jan. 31, 1985, 60-16789

Int. Cl.[4] H01L *33/00*

U.S. Cl. 357—17 **10 Claims**



1. In a light emitting diode made of a compound semiconductor material, comprising:

a semiconductor substrate of a first conductivity type;

a double hetero-junction structure obtained by sequentially forming at least a clad layer of a first conductivity type, an active layer, and a clad layer of the second conductivity type by a vapor deposition method on the substrate in that order; and

a current narrowing structure obtained by selectively forming a contact metal on the clad layer of the second conductivity type in the double hetero-junction structure with an insulating film formed around the contact metal,

in which, among the clad layers in the double hetero-junction structure, the clad layer closer to said semiconductor substrate and is comprised of a multi-layer structure having different composition ratio, and the layer forming the double-layer and the doublelayer forming the multi-layer structure and closer to the active layer has a wider forbidden band than that of the other layer in the multi-layer (s) structure.

4,706,102

MEMORY DEVICE WITH INTERCONNECTED POLYSILICON LAYERS AND METHOD FOR MAKING

David S. Pan, Doylestown; Kanak C. Sarma, North Wales, both of Pa.; Mark A. Halfacre, Portland, Me.; Alexander H. Owens, Pennington, N.J., and Brian K. Rosier, Jenkintown, Pa., assignors to Sprague Electric Company, North Adams, Mass.

Filed Nov. 7, 1985, Ser. No. 795,810

Int. Cl.[4] H01L *29/78, 27/02, 29/04;* **G11C** *11/34*

U.S. Cl. 357—23.5 **9 Claims**

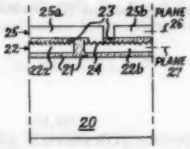
1. A semiconductor device of the kind having a floating gate that may be electrically charged and electrically discharged comprising:

a semiconductor silicon substrate;

first and second co-level conductive polysilicon patches lying adjacent to and spaced from said substrate, the inner and outer surfaces of said first and second co-level polysilicon patches being smooth and textured respectively;

a contiguous unfurled insulative layer having been formed over said outer textured surfaces of said first and second polysilicon patches; and

third and fourth co-level conductive polysilicon patches



formed on said contiguous insulative layer, said inner and outer surfaces of said third and fourth co-level polysilicon patches being smooth, said third polysilicon patch overlying said first patch and extending over a part of said second polysilicon patch and physically and electrically contacting said second patch through a via hole provided therefor in said contiguous unfurled insulative layer, said hole being spaced from at least one edge of said second patch, said third and second patches having a region of non-contacting overlap at said edge, said contacting-second and third polysilicon patches together being electrically isolated and serving as said floating gate.

4,706,103

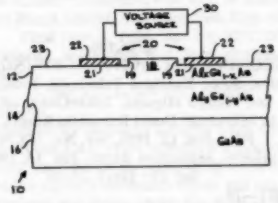
BIPOLAR ELECTRODE SCHEME FOR ELECTRO-OPTIC SEMICONDUCTOR WAVEGUIDE DEVICES

Tirumala R. Ranganath, Palo Alto, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 17, 1985, Ser. No. 745,551

Int. Cl.[4] H01L *27/14, 29/161*

U.S. Cl. 357—30 **19 Claims**



1. An electrode assembly for applying a bipolar electric field to an electro-optical waveguide region formed in a semiconductor structure, comprising a pair of rectifying electrodes formed on the semiconductor structure about the waveguide region; and means for applying a bipolar voltage exclusively across said electrodes.

4,706,104

ELECTRICAL CONTACTS CONTAINING THALLIUM (III) OXIDE

Jay A. Switzer, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 653,353, Sep. 24, 1984, Pat. No. 4,608,750, which is a division of Ser. No. 518,814, Aug. 1, 1983, Pat. No. 4,492,811, which is a division of Ser. No. 740,182, May 31, 1985, Pat. No. 4,626,322. This application Oct. 21, 1985, Ser. No. 789,564

Int. Cl.[4] H01L *23/48*

U.S. Cl. 357—67 23 Claims

1. An electronic semiconductor device having at least one contact forming a non-rectifying junction, said non-rectifying junction containing thallium (III) oxide and a p-type semiconductor.

4,706,105

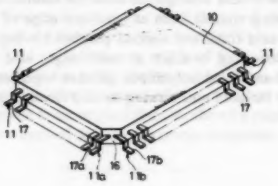
SEMICONDUCTOR DEVICE AND METHOD OF PRODUCING THE SAME

Masachika Masuda, Kodaira, and Gen Murakami, Machida, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 463,246, Feb. 2, 1983, abandoned. This application Jun. 13, 1986, Ser. No. 874,121

Int. Cl.[4] H01L *23/02, 23/04, 23/10, 23/48*

U.S. Cl. 357—74 12 Claims



1. A semiconductor device comprising a package body, made of a resin, encapsulating a semiconductor element, said package body having four sides and having a regular square or oblong shape, a plurality of connection leads which jut out from each of the four sides of said package body, a tab surrounded by said connection leads and having said semiconductor element positioned thereon, tab suspending leads extending from said tab, and a chamfered portion which is formed in at least one corner of said package body, said plurality of connection leads being connected to electrode pads on the semiconductor element, at least one of said plurality of connection leads jutting out from said chamfered portion.

4,706,106

SEMICONDUCTOR LIGHT RECEIVING DEVICE

Tetsuo Shiba, Suita; Kazuhisa Takahashi, Itami; Kenji Ikeda, Hyogo, and Hideyo Higuchi, Takarazuka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1985, Ser. No. 743,747

Claims priority, application Japan, Jun. 14, 1984, 59-124145

Int. Cl.[4] H01L *23/26*

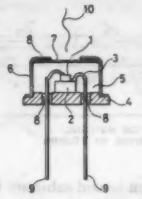
U.S. Cl. 357—78 3 Claims

1. A semiconductor light receiving device, which comprises:

a photo diode having a polyimide film as a surface protection film;

an airtightly sealed package containing said photo diode; and

an ambient gas including means for preventing an increase in a dark current characteristic of said light receiving device, said means for preventing consisting essentially of oxygen of a sufficient concentration in said ambient gas to prevent



said increase in the dark current characteristic of said light receiving device.

4,706,107

IC MEMORY CELLS WITH REDUCED ALPHA PARTICLE INFLUENCE

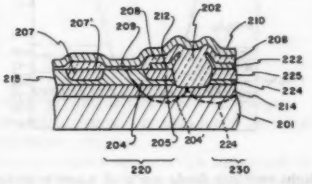
Kazuo Terada; Susumu Kurosawa, and Shunichi Suzuki, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Japan

Continuation of Ser. No. 385,321, Jun. 4, 1982, abandoned. This application Feb. 20, 1986, Ser. No. 830,919

Claims priority, application Japan, Jun. 4, 1981, 56-86208; Jun. 4, 1981, 56-86209; Jun. 4, 1981, 56-86210; Jun. 4, 1981, 56-86213; Jun. 4, 1981, 56-86214; Jun. 4, 1981, 56-86215; Jun. 4, 1981, 56-86216

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.5 13 Claims



1. A semiconductor memory device of the type having a first field effect transistor of a first channel conductivity type and a second field effect transistor of a second channel conductivity type, said first transistor being adapted to supply a substrate region of said second transistor with one of first and second potentials thereby changing a threshold voltage of said second transistor, said semiconductor memory device comprising a semiconductor substrate of one conductivity type, a first semiconductor region of one conductivity type in said semiconductor substrate, a second semiconductor region of the opposite conductivity type formed in said first semiconductor region, a third semiconductor region of the opposite conductivity type formed in contact with said first semiconductor region, a fourth semiconductor region of said one conductivity type formed in said third semiconductor region, a fifth semiconductor region of said one conductivity type formed within said semiconductor substrate having an impurity concentration which is higher than an impurity concentration of said first semiconductor region, said fifth region extending under said third semiconductor region, and making contact with the bottom surface of said third semiconductor region to form a PN junction therewith, said PN junction providing a capacitance between said third and fifth semiconductor regions, a gate insulating layer formed on said first and third semiconductor regions, and a conductive layer formed on said gate insulating layer, wherein said second and third semiconductor regions serving as a drain and a source of said first transistor, said first region and a first part of said conductive layer above the surface of said first region serve as a substrate region and a gate of said first transistor, respectively, said first and fourth semi-

conductor regions serving as a drain and a source of said second transistor, respectively said third semiconductor region and a second part of said conductive layer above the surface of said third semiconductor region serving as a substrate region and a gate, respectively, of said second transistor, respectively.

4,706,108

AUTOMATIC SETUP SYSTEM FOR CONTROLLING COLOR GAIN, HUE AND WHITE BALANCE OF TV MONITOR

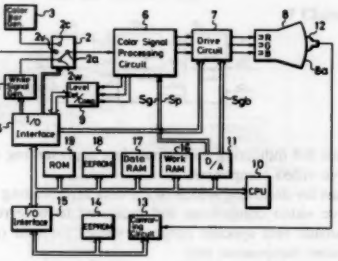
Toru Kumagai, Tokyo, and Yoshihiro Kosugi, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 8, 1986, Ser. No. 849,528

Claims priority, application Japan, Apr. 12, 1985, 60-77956; Apr. 12, 1985, 60-77957

Int. Cl.⁴ H04N *17/04*

U.S. Cl. 358—10 **3 Claims**



1. Television monitor control apparatus comprising:

color bar generator means that generates a color bar signal supplied as a standard television signal;

signal processing means supplied with said color bar signal and including a color gain control amplifier, a color hue control circuit, and drive bias and drive gain control circuits; and

signal control means connected to said signal processing means for adjusting the operation of said signal processing means;

wherein said signal control means includes level detecting and comparing means, means operating said level detecting and comparing means to compare the level of a blue color portion of said color bar signal as processed by said signal processing means with the level of the blue component of a white portion of the processed color bar signal, means for adjusting the gain of said color gain control amplifier in response to an output of said level detecting and comparing means so as to achieve coincidence of the levels of the compared blue portion and blue component of the white portion of said processed color bar signal, means operating said level detecting and comparing means to compare the level of said blue component of the white portion of the processed color bar signal with the level of the blue component of a cyan or magenta portion of the processed color bar signal, and means for adjusting said color hue control circuit in response to an output of said level detecting and comparing means so as to achieve coincidence of the levels of the compared blue components of the white portion and of the cyan or magenta portion of the processed color bar signal.

2. Television monitor control apparatus comprising:

white signal generator means that generates high level white and low level white signals each including three primary color signals;

a color cathode ray tube supplied with a color signal;

a drive circuit for said color cathode ray tube;

reference signal memory means for storing at least one set of reference signals; and

signal control means connected to said reference signal memory means for adjusting the operation of said drive circuit;

wherein said signal control means includes brightness detecting means detecting a brightness of said color cathode ray tube, and means for controlling said drive circuit on the basis of a comparison of a signal from said reference signal memory means with a signal corresponding to the detected brightness of said tube.

4,706,109

TELEVISION TRANSMISSION SYSTEM

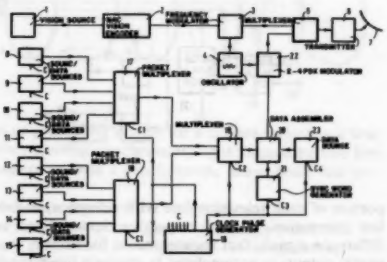
Bruce Murray, Slough, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 30, 1985, Ser. No. 739,333

Claims priority, application United Kingdom, Jun. 8, 1984, 8414665

Int. Cl.⁴ H04N *7/20*

U.S. Cl. 358—12 **6 Claims**



1. A television transmission system having a time multiplexed signal in component form the majority of the lines of a frame period of which contain a digital data burst component and a vision component, the data in the data burst component, which is derived from a plurality of sources, being time multiplexed as a series of blocks from each source in the data burst which has a given data rate, characterized in that said sources are divided into a number of groups and the data from the sources for each group is time multiplexed as a series of blocks of bits from each source in a data bit stream to form a corresponding number of sub-multiplexes, the data bits forming each of the relevant lines of the data burst being derived from each of the said number of data bit streams at the said given data bit rate with the number of bits in a data burst corresponding to an integral multiple of the said number of groups.

4,706,110

APPARATUS FOR DECODING A PAL STANDARD COLOR TELEVISION SIGNAL

Hans-Peter Richter, Griesheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 5, 1986, Ser. No. 927,735

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539416

Int. Cl.⁴ H04N *9/45, 9/465*

U.S. Cl. 358—19 **8 Claims**

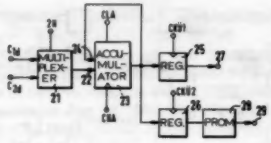
1. An apparatus for decoding a digital color television signal conforming to the PAL color television signal standard comprising comb filter means for separating from the composite color television signal a luminance signal and two color difference signals and supplying them for further processing at corresponding outputs, means for generating a color carrier signal having a control input, timing pulse generating means synchronized to horizontal synchronizing pulses of said color television signal, first and second synchonous demodulators connected respectively to the outputs of said comb filter means for said color difference signals and both connected to said

generating means for respectively producing demodulated color difference signals, and comb filter output processing means including a phase reversal circuit for reversing the phase of one color component signal for successive television lines,

a color burst evaluation circuit for controlling said color carrier generator and said polarity reversing circuit, comprising:

a multiplexer connected to receive, at first and second inputs thereof, said demodulated color difference signals (C_{1d}, C_{2d}) connected to receive a binary meander timing signal of twice the television line period (2H) at a third input thereof for alternately presenting one-line segments of said color difference signals at an output thereof;

an accumulator having a first input connected to the output of said multiplexer, an output and a second input connected to said output and additional inputs, including a sampling rate pulse input, connected to outputs of said timing pulse generating means for evaluationg, by accumulating samples at said sampling rate the color burst



portion of each television line with reference, in line by line alternation, to said respective demodulated color difference signals, first register means for storing, successively, outputs as accumulated in alternate line periods by said accumulator by sampling a first of said color difference signals and thereby provide a signal for said control input of said color carrier generator;

second register means for storing, successively, outputs as accumulated in alternate line periods by said accumulator by sampling the second of said color difference signals and providing an output for further processing, and

accumulator output evaluation means having an input connected to said output of said second register means and an output connected to said phase reversal circuit for correcting the control thereof in the event the output of said second register means, as evaulated by said accumulator output evaluation means, indicates that the control signals for said phase reversal means have been in erroneous polarity.

4,706,111

METHOD OF ERROR MODIFICATION FOR VIDEO DATA

Takao Abe, and Tetsuo Ogata, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 17, 1986, Ser. No. 853,138
Claims priority, application Japan, Apr. 19, 1985, 60-084103
Int. Cl.[4] H04N *9/88*
U.S. Cl. 358—21 R **10 Claims**

2. A method of modifying errors in data representing video components having predetermined normal relationships to each other, comprising the steps of:

determining specific ranges of values for the data representing each of said video components on the basis of said normal relationships to the other of said video components;

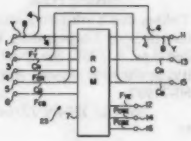
indicating erroneous data representing a respective video component;

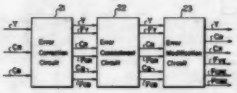
detecting which of the data representing a respective video component and indicated to be erroneous is outside the specific range of values determined for said respective video component; and

modifying the detected erroneous data by replacing the latter with predetermined data from within said specified range therefor.

5. Apparatus for modifying errors in data representing video signal components having predetermined normal relationships to each other, comprising:

means for defining specific ranges of values for the data representing each of said video components on the basis of said normal relationships to the other of said video components;





means for indicating erroneous data representing a respective video component;

means for detecting which of the data representing a respective video component and indicated to be erroneous is outside said specific range of values for said respective video component; and

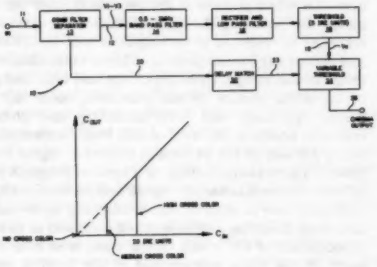
means for modifying said erroneous data selected to be outside said specific range of values therefor by replacing such erroneous data with predetermined data from within the respective specific range.

4,706,112

CROSS COLOR SUPPRESSION FOR QUADRATURE MODULATED COLOR TELEVISION

Yves C. Faroudja, Los Altos, and Jack J. Campbell, San Francisco, both of Calif., assignors to Faroudja Laboratories, Inc., Sunnyvale, Calif.

Filed Jan. 31, 1986, Ser. No. 825,105
Int. Cl.[4] H04N *9/78*
U.S. Cl. 358—31 **18 Claims**



1. A method for reducing cross-color artifacts occurring at a diagonal luminance transition in a quadrature modulated color television signal in which a chrominance component carried on a color subcarrier has been separated from the signal by comb filter processing, including the steps of

detecting the occurrence of a diagonal luminance transition in the signal,

developing a control signal from a mid-band portion of the

luminance spectrum of the detected luminance transition lying effectively outside of the chrominance pass band and processing the chrominance component under the control of the control signal to reduce the cross-color artifacts in the chrominance component at the instance of the detected luminance transition.

4,706,113

CONTOUR DETECTING FILTER DEVICE USING PAL SAMPLES OF COMPOSITE VIDEO SIGNALS WITHOUT SEPARATION OF LUMINANCE SIGNALS THEREFROM

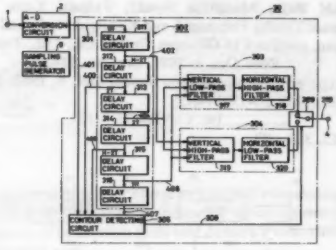
Hiroshi Ito, and Yoshiki Mizutani, both of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1986, Ser. No. 826,916

Claims priority, application Japan, Feb. 18, 1985, 60-31129; Feb. 26, 1985, 60-37088; Mar. 7, 1985, 60-45206; Mar. 25, 1985, 60-62486

Int. Cl.[4] H04N *5/208*

U.S. Cl. 358—37 **7 Claims**



1. A contour detecting filter device comprising:

A-D conversion means (2) for sampling composite video signals of the PAL system at a frequency integral times the chrominance subcarrier frequency thereof to obtain sampling values having the same-phased chrominance subcarriers per four horizontal scanning lines in the vertical direction on the screen;

first delay means (311) for delaying output signals from said A-D conversion means (2) by one horizontal scanning interval;

second delay means (312) for delaying output signals from said first delay means (311) by a period obtained by subtracting two sampling periods from one horizontal scanning interval;

third delay means (313) for delaying output signals from said second delay means by two sampling periods;

fourth delay means (314) for delaying output signals from said third delay means by two sampling periods;

fifth delay means (315) for delaying output signals from said fourth delay means by a period obtained by subtracting two sampling periods from one horizontal scanning interval;

sixth delay means (316) for delaying output signals from said fifth delay means by one horizontal scanning interval;

a horizontal contour detecting filter (303) for detecting contour signals in the horizontal scanning direction from said composite video signals on the basis of said output signals from respective said first, third and fifth delay means (311, 313, 315);

a vertical contour detecting filter (304) for detecting contour signals in the vertical direction on the screen from said composite video signals on the basis of said output signals from respective said first, third and fifth delay means (311, 313, 315);

comparator means (705) for comparing first absolute differential value (703) between said output signals from respective said second and fourth delay means (312, 314) with second absolute differential value (704) between said output signals from said A-D conversion means (2) and said sixth delay means (316); and

selection means (309) for selecting said output signals from either said horizontal contour detecting filter (303) or said vertical contour detecting filter (304) in response to the result of comparison by said comparator means (705).

4,706,114

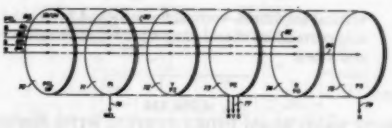
COLOR PROCESSING SYSTEM FOR TELEVISION CAMERA

Neill C. Cross, Star Rte. Box 270, Morristown, Ariz. 85342

Continuation-in-part of Ser. No. 377,342, May 12, 1982, abandoned. This application Mar. 12, 1985, Ser. No. 710,676

Int. Cl.[4] H04N *9/09*

U.S. Cl. 358—50 **2 Claims**



1. A color processing system for a camera including a lens, said system receiving panchromatic light focused by said lens of said camera to form a panchromatic image beam and producing

a panchromatic signal of the image beam,

a primary additive color signal of the image beam; and

a primary subtractive color signal of the image beam,

said system including

(a) a first transparent photosensitive surface for receiving at least a portion of said panchromatic image beam and producing an electrical signal thereof;

(b) a first transparent color filter for receiving at least a portion of said panchromatic image beam, said first filter permitting a primary substractive color image beam to pass therethrough;

(c) a second transparent photosensitive surface for receiving at least a portion of said primary subtractive color image beam passed by said first color filter and producing an electrical signal thereof;

(d) a second transparent color filter for receiving at least a portion of said primary substractive color light image beam passed by said second photosensitive surface, said second filter permitting a primary additive color beam to pass therethrough; and

(e) a third photosensitive surface for receiving at least a portion of said primary additive color image beam passed by said second transparent color filter and producing an electrical signal thereof.

4,706,115

GEOMETRY ADJUSTMENT CIRCUIT FOR A COLOR VIDEO PROJECTOR PRODUCING VERTICAL AMPLITUDE, VERTICAL LINEARITY AND HORIZONTAL TRAPEZOID CORRECTION SIGNALS FROM A SINGLE USER-CONTROLLED SIGNAL

Joseph Colineau, Seiches sur Loir, and Hossein Ahmari, Angers, both of France, assignors to Societe Electronique de la Region Pays de Loire, Paris, France

Filed Mar. 17, 1986, Ser. No. 840,163

Claims priority, application France, Mar. 15, 1985, 85 03901

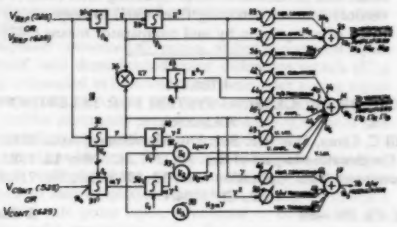
Int. Cl.[4] H04N *9/31, 3/233, 9/18;* **H01J** *29/70*

U.S. Cl. 358—60 **11 Claims**

1. A geometry adjustment device for a color video projector comprising three monochrome tubes each projecting an image of a given color on a screen, said geometry adjustment device comprising:

a user-controlled device,

geometry adjustment circuit means responsive to said user-controlled device for modifying a single signal to produce



vertical amplitude, vertical linearity and horizontal trapezoid corrections of said images projected on said screen by said tubes.

4,706,116

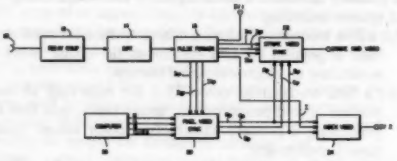
WIDE BAND BEAM INDEX SYSTEM WITH IMPROVED BRIGHTNESS

Richard W. Midland, Inverness, and Boris Rozansky, Skokie, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 8, 1986, Ser. No. 916,572

Int. Cl.[4] H04N *9/24*

U.S. Cl. 358—67 **5 Claims**



1. In a wide band beam index CRT system of the type including a CRT having a single electron beam and a viewing screen formed of a pattern of groups of different colored light emitting phosphor stripes with individual stripes being separated by guard bands of inert material, index strips disposed on the obverse side of certain of said guard bands, and means for developing an index signal for controlling the application of different color video data to said CRT coincident with the electron beam in said CRT being in position to strike different color phosphor stripes, said CRT having a given stripe brightness capability with a given signal to noise ratio for said index signal, the improvement comprising:

means for modifying operation of said electron beam when positioned to strike an index strip in the presence of color video data corresponding to color phosphor stripes adjacent an index strip for increasing the brightness capability of said stripes without degrading the signal-to-noise ratio of the index signal.

4,706,117

STEREO LASER DISC VIEWING SYSTEM

Arnold Schoolman, 6700 Troost, Suite 144, Kansas City, Mo. 64131

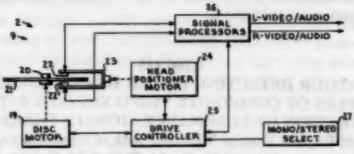
Continuation-in-part of Ser. No. 616,385, Jun. 1, 1984, Pat. No. 4,559,555, which is a continuation-in-part of Ser. No. 351,917, Feb. 24, 1982, abandoned. This application Dec. 17, 1985, Ser. No. 810,870

Int. Cl.[4] H04N *5/85, 13/04*

U.S. Cl. 358—88 **22 Claims**

21. In an optical video disc playback unit including a head positioned and movable to read an optically recorded signal on one side of an optical video disc, the improvement comprising:

(a) a pair of heads positioned in spaced apart relation on a



single head positioner member which is movable is to simultaneously position said heads to read a first and a second track optically recorded at different positions on an optical video disc.

4,706,118

CONTROL CIRCUIT FOR VIDEO ENDOSCOPE

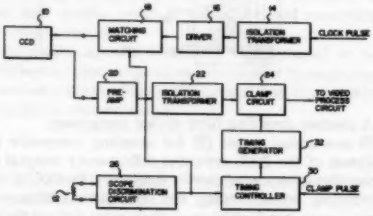
Shinichi Kato; Masahiko Sasaki; Tadashi Kato; Masahide Kanno; Yutaka Takahashi, and Katsuyuki Saito, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1986, Ser. No. 914,168

Claims priority, application Japan, Oct. 9, 1985, 60-225368; Oct. 18, 1985, 60-159514[U]

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—98 **10 Claims**



1. A control circuit for video endoscope, comprising:

means for detecting the type of a video endoscope connected to the control circuit;

means for modifying the waveform of clock pulses in accordance with the result of detection by the detecting means, and supplying the modified clock pulses to a solid-state pickup element in the endoscope; and

means for converting image signal pulses, supplied from the pickup element, into a continuous image signal, by clamping, or sampling and holding the pulses, with a timing corresponding to the detection result given by the detecting means.

4,706,119

CAMERA VISION AXIS INCLINATION INDICATION APPARATUS

Howard L. Shatto, Jr., Houston, Tex., and George A. Smith, Jefferson, La., assignors to Shell Offshore Inc., Houston, Tex.

Filed Sep. 11, 1985, Ser. No. 774,788

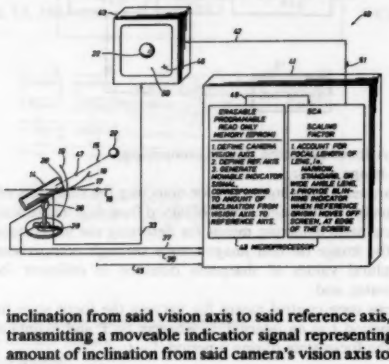
Int. Cl.[4] H04N *7/18, 5/262*

U.S. Cl. 358—99 **1 Claim**

1. Camera vision axis inclination indication apparatus for indicating the amount of inclination from a vision axis to a reference axis, said reference axis defined, parallel to a preferred direction of motion of a vehicle, said direction determined upon actuation of selected thrusters operatively engaged to said vehicle, said thrusters producing thruster selection signals, said vision axis defined through viewing means carried by a camera and objects viewed by said viewing means

located in front of said viewing means, said camera operatively engaged to said vehicle, said vehicle carrying camera inclination signals indicating the inclination of said vision axis relative to said vehicle, said inclination signals transmittable from said inclination signal means through signal transmission means, said camera vision axis inclination indication apparatus comprising;

a moveable indicator signal generation means capable of receiving said thruster selection signals and capable of receiving said camera inclination signals from said signal transmission means, thereafter defining the orientation of said vision axis relative to said vehicle, defining the orientation of said reference axis parrallel to a preferred direction of motion of said vehicle, calculating the amount of



inclination from said vision axis to said reference axis, and transmitting a moveable indicatior signal representing the amount of inclination from said camera's vision axis to said reference axis,

a moveable indicator display means having a viewing area capable of receiving said moveable indicator signal and displaying a moveable indicator on the viewing area, the distance of said moveable indicator from the center of the viewing area representing the amount of inclination from said vision axis to said reference axis, and

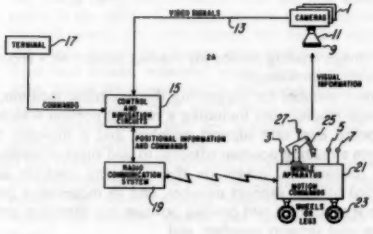
moveable indicator signal transmission means capable of receiving said moveable indicator signal from said signal generation means and transmitting said signal to said moveable indicator display means.

4,706,120

MODULAR, VISION SYSTEM FOR AUTOMATION OF INSPECTION AND PROCESS CONTROL

John E. Slaughter, Richardson, and Robert B. Terrell, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 30, 1985, Ser. No. 771,433
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—103 **17 Claims**



1. A vision control system for obtaining an image of a mobile apparatus that is electrically controllable, comprising:

means for obtaining a gray scale image of the mobile apparatus;

means for generating control commands to control the mobile apparatus from the gray scale image of the mobile apparatus; and

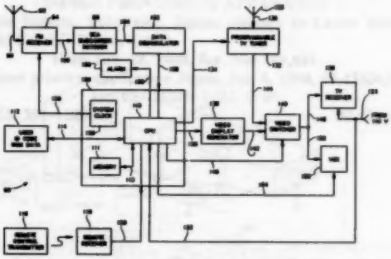
means for controlling the mobile apparatus in response to the control commands.

4,706,121

TV SCHEDULE SYSTEM AND PROCESS

Patrick Young, 1496 Cherrywood Dr., San Mateo, Calif. 94403

Continuation-in-part of Ser. No. 754,630, Jul. 12, 1985, abandoned. This application May 6, 1986, Ser. No. 860,077
Int. Cl.[4] H04N 7/093, 7/08
U.S. Cl. 358—142 **56 Claims**



1. A system for controlling a television receiver to allow user selection of broadcast programs from schedule information, which comprises a data processor, a first input means for the schedule information connected to said data processor, a second user selection input means connected to said data processor, said data processor being configured to select programs from the schedule information based on user inputs, storage means connected to receive the schedule information for programs selected by said data processor, and a programmable tuner for connection to the television receiver, said programmable tuner being connected to receive control signals from said data processor at a time of a selected broadcast for causing said programmable tuner to supply broadcast signals for the selected program to the television receiver, said data processor being configured to supply an actuating signal to a program recorder at the time of a broadcast program selected by said data processor and to supply the broadcast signal for the selected program to said program recorder, said system being configured to allow said television receiver to receive a different program than the broadcast signal for the selected program supplied to said program recorder.

4,706,122

SOLID-STATE IMAGING DEVICE COMPATIBLE WITH DIFFERENT TELEVISION SYSTEMS

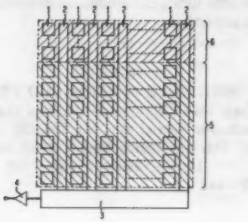
Ikuo Akiyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

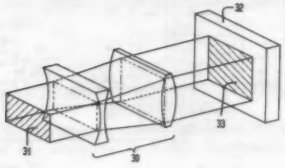
Filed Aug. 30, 1985, Ser. No. 771,837
Claims priority, application Japan, Aug. 30, 1984, 59-180979; Nov. 16, 1984, 59-241751
Int. Cl.[4] H04N 3/14
U.S. Cl. 358—213.13 **4 Claims**

1. A solid-state imaging device compatible with a first television system having a first scanning line number and a first aspect ratio and a second television system having a second scanning line number greater than said first scanning line number and a second aspect ratio different from said first aspect ratio, said device comprising:

a first imaging area, the number of picture elements in a vertical direction in said first imaging area corresponding to said first scanning line number;

a second imaging area provided adjacent to said first imaging area in a vertical direction, the number of picture elements in the vertical direction in said second imaging





area corresponding to a difference between said first and second scanning line numbers; and

imaging means for converting said second aspect ratio to said first aspect ratio.

4,706,123

PHOTOSENSITIVE DEVICE WITH LOCALLY ADJUSTABLE EXPOSURE TIME

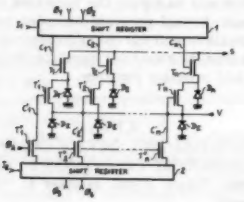
Jacques Chautemps, St. Egreve, France, assignor to Thomson CSF, Paris, France

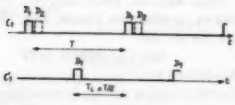
Filed Apr. 7, 1986, Ser. No. 848,476

Claims priority, application France, Apr. 5, 1985, 85 05254

Int. Cl.[4] H04N *3/14, 5/235*

U.S. Cl. 358—213.19 **10 Claims**





1. A photosensitive device comprising at least one line of photosensitive detectors, and further comprising means providing local modification of the integration time, of some detectors, as a function of the lighting received by each detector.

4,706,124

FOCUS DETECTING DEVICE WHICH VARIES BETWEEN A VARYING STATE AND A FIXED STATE

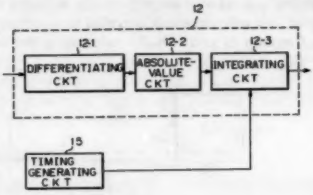
Takeshi Baba, and Shigeyuki Suda, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 832,722, Feb. 25, 1986, abandoned. This application Feb. 12, 1987, Ser. No. 15,532

Claims priority, application Japan, Feb. 26, 1985, 60-36769

Int. Cl.[4] G03B *3/10*

U.S. Cl. 358—227 **22 Claims**



1. A focus detecting device comprising:

an image sensor;

sharpness detecting means for detecting the sharpness of an image from image signals obtained from said image sensor;

focus state detecting means for detecting the focus state of the image on said image sensor through comparison of plural values of sharpness detected in different focus states; and

focus state control means for varying the focus state for a period t at an interval T, wherein $t<T$ and maintaining the focus state during a period $T-t$.

4,706,125

IMAGE READING DEVICE

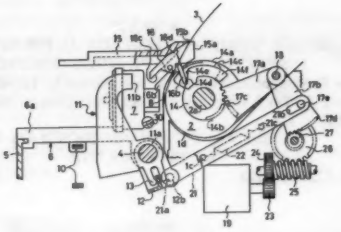
Kazuhiko Takagi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 23, 1986, Ser. No. 854,762

Claims priority, application Japan, Apr. 27, 1985, 60-92107; Apr. 27, 1985, 60-64126[U]; Apr. 27, 1985, 60-64127[U]

Int. Cl.[4] H04N *1/00*

U.S. Cl. 358—256 **14 Claims**



1. An image reading device for reading images on a recording medium, comprising:

a support member for supporting the recording medium;

an image-reading unit including a reading portion which is disposed near said support member, and is movable between a reading position adjacent to said support member, for reading the images on the recording medium supported by said support member, and an inoperative position spaced from said reading position in a direction away from said support member; and

a movable guide member disposed near said support member, and movable between a retracted position in which the guide member does not interfere with said reading

portion of said image-reading unit in said reading position, and a guiding position for guiding the recording medium along a part of a predetermined path along which the recording medium is inserted, said movable guide member being held in said retracted and guiding positions while said reading portion is placed in said reading and inoperative positions, respectively.

4,706,126

FACSIMILE APPARATUS

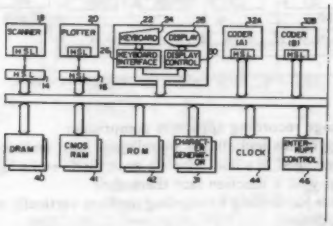
Mitsuru Kondo, Sagamihara, Japan, assignor to Ricoh Company. Ltd., Tokyo, Japan

Filed Oct. 22, 1985, Ser. No. 790,127

Claims priority, application Japan, Nov. 2, 1984, 59-230085; Nov. 2, 1984, 59-230086; Dec. 6, 1984, 59-256507

Int. Cl.[4] H04N *1/32, 1/40, 1/41*

U.S. Cl. 358—257 **9 Claims**



1. A facsimile apparatus comprising:

processor means;

bus means;

store means connected to said bus means for temporarily storing image data;

image data input means connected to the bus means for inputting visible images as image data;

coder means connected to the bus means for compressing the inputted image data;

decoder means connected to the bus means for restoring the received image data to original image data;

communication control means connected to the bus means for transmitting and receiving image data to and from a communication line;

image data output means connected to the bus means for outputting the restored image data as visible images; and

sensing means coupled to said communication control means for sending in a compressed form if a receiving station can accept said image data in a compressed form in response to said sensed ability of said received station to accept data in compressed form and transmitting said image data in a non-compressed form responsive to a sensed inability of said received station to receive data in a compressed form;

wherein the processor means applies instructions to the store means, the image data input means, the communication control means, the coder means, the decoder means and the image data output means over the bus means, and controls the image data input means, the communication control means, the coder means, the decoder means and the image data output means upon reception of responses from said means, whereby image data inputted by the input means are transmitted to the communication line as compressed image data, while image data received over the communication line are outputted by the output means; and further wherein

said bus means causes image data to be transferred between the processor means, the store means, the image data input means, the communication control means, the coder means, the decoder means, and the image data output means;

transmission means for transmitting image data based on a transmission time, which at the beginning of transmission of image data is sent to a transmitting station as a minimum transmission time which is contained in an initial identification signal for a communication control procedure;

recording means for outputting received image data as visible images;

means for said apparatus, at the time of reception of image signals to send to a transmitting apparatus a minimum transmission time, which is a time corresponding to an image data writing rate of said store means when said store means is not full and corresponding to an image data outputting rate of the recording means when the store means is full.

4,706,127

IMAGE PROCESSING APPARATUS

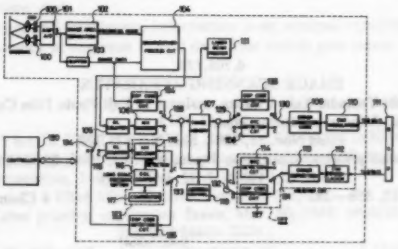
Hiroshi Nobuta, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1985, Ser. No. 749,633

Claims priority, application Japan, Jul. 4, 1984, 59-138361

Int. Cl.[4] H04N *1/32, 1/40*

U.S. Cl. 358—280 **30 Claims**



1. An image processing apparatus comprising:

a memory in which image data is stored;

detecting means for detecting a quantity of stored image data in accordance with a storage address of the image data stored in said memory;

recording means for recording the image data on a recording medium, said recording medium including a plurality of recording sheets having a predetermined size; and

judging means, responsive to said detecting means, for determining whether or not the stored image data can be recorded on one of said recording sheets and, if not, for determining how the stored image data should be divisionally recorded on a plurality of said recording sheets.

4,706,128

IMAGE READING AND CONVERTING APPARATUS

Hiroshi Tanioka, Tokyo; Yoshitaka Ogino, Kawasaki; Yutaka Inoue, Urawa; Masataka Naito, and Kimiaki Hayakawa, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1984, Ser. No. 679,237

Claims priority, application Japan, Dec. 14, 1983, 58-234168; Jan. 27, 1984, 59-12098

Int. Cl.[4] H04N *1/04, 1/10*

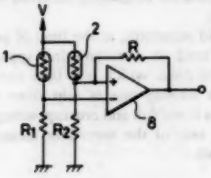
U.S. Cl. 358—286 **17 Claims**

1. An image reading apparatus, comprising:

a light source for lighting an original;

reading means for reading the original exposed by said light source and outputting an image signal;

converting means for converting the image signal from said reading means into a recording signal; and



control means for controlling a condition of an exposure of said light source in response to a relative movement velocity between said reading means and the original.

4,706,129

IMAGE SCANNING APPARATUS

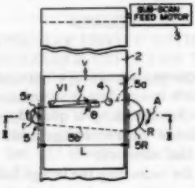
Junichi Yamada, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 15, 1984, Ser. No. 671,778

Claims priority, application Japan, Nov. 17, 1983, 58-216846

Int. Cl.[4] H04N *3/02, 1/04, 1/10*

U.S. Cl. 358—293 **4 Claims**



1. An image scanning apparatus comprising:

(i) a recording material supporting means for supporting a recording material in a straightly moveable manner,

(ii) an endlessly moveable member positioned close to said recording material supported on said supporting means for movement in a plane parallel to said recording material along straight lines parallel to said recording material and at an oblique angle with respect to the movement direction of said recording material,

(iii) a main-scanning feed means for rotating said endlessly moveable member,

(iv) at least one of a light detecting means and a light emitting means supported on said endlessly moveable member, and

(v) a sub-scanning feed means for moving said recording material supporting means at a velocity approximately equal to the velocity component of said endlessly moveable member in the movement direction of said recording material, wherein said main-scanning feed means comprises a rotation path member such that said rotation path member and said endlessly moveable member respectively constitute a primary iron core and a secondary conductor plate of a linear induction motor with said recording material intervening therebetween.

4,706,130

IMAGE RECORDING APPARATUS UTILIZING LIGHT EMITTING DIODES WITH PIXEL SHAPE CORRECTION

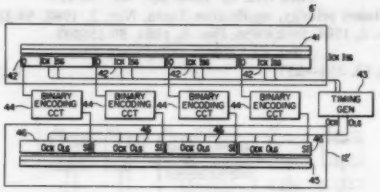
Tadashi Yamakawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 636,492, Aug. 1, 1984, abandoned. This application Jan. 29, 1987, Ser. No. 9,107

Claims priority, application Japan, Aug. 8, 1983, 58-143700; Aug. 8, 1983, 58-143701; Aug. 8, 1983, 58-143702; Aug. 8, 1983, 58-143703; Aug. 8, 1983, 58-143704; Dec. 23, 1983, 58-242105

Int. Cl.[4] H04N *1/21, 1/23;* **G01D** *15/06*

U.S. Cl. 358—296 **15 Claims**



1. An image recording apparatus comprising:

recording means including a plurality of light emission diodes arranged in a line, wherein each diode emits light in parallel with a junction face thereof;

shift means for shifting a recording medium vertically to the line direction;

drive means for driving each of said plurality of light emission diodes, respectively, on the basis of input image data; and

control means for controlling said drive means to drive each said light emission diode in a line plural times with the same respective image data while shifting the recording medium so that the same line image data is recorded plural times by the light emission diodes in a line on the shifted positions, in recording medium.

4,706,131

PHOTOGRAPHIC COPIER IMAGE CONTRAST CONTROL

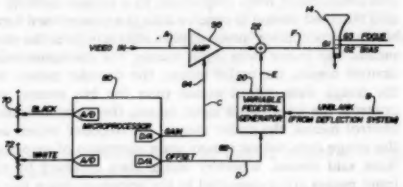
Herbert Perten, Pomona, N.Y., and William Ambrose, Irvington, N.J., assignors to Johnson & Johnson Ultrasound, Inc., Ramsey, N.J.

Filed Mar. 10, 1986, Ser. No. 837,994

Claims priority, application United Kingdom, Mar. 25, 1985, 8507652

Int. Cl.[4] H04N *1/21, 5/16;* **G01D** *9/42, 15/16*

U.S. Cl. 358—302 **10 Claims**



1. In a hard copy recorder, in which light-sensitive paper or film is exposed to an image produced by a cathode ray tube, apparatus for controlling image contrast comprising:

a source of video signals;

first and second controls for separately adjusting image intensity and background shading;

means, coupled to said first and second controls, for developing a first control signal representative of background shading, and for developing a second control signal repre-

sentative of image intensity and determining a maximum intensity level established solely by said image intensity control setting;

means for amplifying video signals produced by said source by a factor determined by said second control setting;

means for producing a video pedestal signal exhibiting a level determined by said first control signal;

means for combining said amplified video signals and said video pedestal signal; and

means for applying said combined signals to said cathode ray tube.

4,706,132

VIDEO SIGNAL PROCESSING SYSTEM

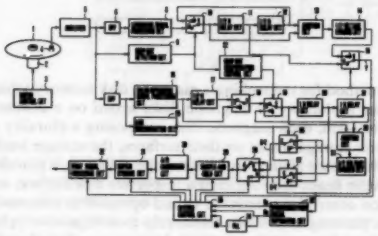
Makoto Takayama, and Nobuaki Sakurada, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1985, Ser. No. 715,082

Claims priority, application Japan, Mar. 23, 1984, 59-56693

Int. Cl.[4] H04N 5/94

U.S. Cl. 358—336 **44 Claims**



1. A video signal processing system comprising:

(a) A/D converting means for analog-to-digital converting an input video signal including line interpolating signals;

(b) storing means for storing data produced from said A/D converting means;

(c) coefficient multiplying means for multiplying by coefficients said data stored by said storing means, said coefficients and said data are multiplied to compensate intervals between said line interpolating signals; and

(d) designating means for designating said coefficients to such a value as that the data stored by said storing means are interpolated.

4,706,133

METHOD AND APPARATUS FOR RECOVERING INFORMATION FROM A VIDEODISC

Gary M. Giddings, Laguna Hills, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 569,103, Jan. 9, 1984, abandoned, which is a division of Ser. No. 368,792, Jan. 14, 1982, Pat. No. 4,536,863. This application Dec. 26, 1985, Ser. No. 813,341

Int. Cl.[4] H04N 5/76; G11B 21/00

U.S. Cl. 358—342 **16 Claims**

1. A method of transmitting intelligence information from a playback device to an external receiving device said intelligence information being recorded in at least one video field of a video information signal recorded on a record medium, the video information signal being recovered by said video playback device, the video information further containing in part a sequence of vertical synchronization pulses occurring at a field rate, wherein a white flag identifies the end of the second field of a two field per frame set, said method comprising the steps of:

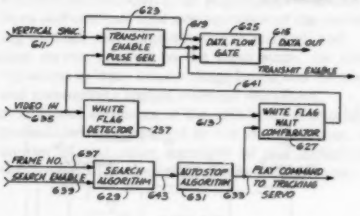
searching for, locating, and playing a designated frame next preceding in time the video field containing at least the beginning of said intelligence information;

detecting the next white flag signal occurring in time, said next white flag signal being the one associated with said designated frame;

jumping back two fields responsive to detecting said next white flag signal;

playing said two fields in a forward play mode;

utilizing the next vertical synchronization pulse in time, after said jumping back two fields and during playing of said two fields, to generate a transmit enable pulse;



utilizing the transmit enable pulse to generate a data flow enable gate signal at the coincidence of said transmit enable pulse and the next white flag signal occurring in time; and

gating said intelligence information to an external receiving device in response to said data flow enable gate signal.

4,706,134

PLAYBACK UNIT FOR STILL PICTURES WITH SOUND

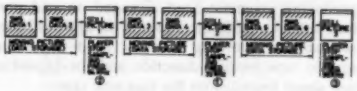
Takumi Jinguji, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 29, 1985, Ser. No. 718,125

Claims priority, application Japan, Mar. 30, 1984, 59-62616

Int. Cl.[4] H04N 5/76

U.S. Cl. 358—343 **1 Claim**



1. A method of transferring data from a playback unit for still pictures with sound to an external utilization device such as a personal computer, comprising the steps of:

(a) storing in a buffer memory still-with-sound data comprising an initial frame of control data, composite data comprising a plurality of segments of which some consist of digital audio data and others consist of digital data other than audio data, and video data;

(b) reading data out of said buffer memory;

(c) determining whether step (b) is a normal read operation in which data read from said buffer memory is to be transferred to said external utilization device;

(d) for a normal read operation, checking to determine whether the data being read from said buffer memory is said composite data;

(e) if in step (d) the data is said composite data, determining which segments of said composite data contain audio data;

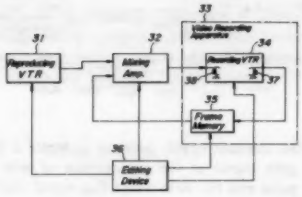
(f) transferring each segment of said composite data containing audio data to said external utilization device; and

(g) after all segments of said composite data containing audio data have been transferred to said external utilization device, transferring to said external utilization device the remaining segments of said composite data containing said digital data other than said audio data.

4,706,135
VIDEO RECORDING APPARATUS WITH EDITING AND MIXING OF DELAYED MONITORED VIDEO SIGNAL USING EQUIDISTANT RECORD, READ AND ERASE HEADS

Nobutoshi Kojima, Nagoya, Japan, assignor to Tokai Television Broadcasting Company Limited, Aichi, Japan

Filed Jan. 10, 1986, Ser. No. 817,550
Int. Cl.[4] H04N 5/782; G11B 27/02
U.S. Cl. 360—14.1 9 Claims



1. A video recording apparatus, comprising:

magnetic tape feeding means for feeding a magnetic tape along a predetermined helical tape feeding path at a given speed in a given direction, said magnetic tape feeding means comprising a rotary member including a rotary drum arranged coaxially with a fixed drum, said rotary and fixed drums defining the helical tape feeding path;

a recording magnetic head arranged on said predetermined helical tape feeding path for recording a video signal on the magnetic tape;

a reproducing magnetic head arranged on said predetermined helical tape feeding path at an upper stream position than the recording magnetic head viewed in said magnetic tape feeding direction and for reproducing a video signal recorded on the magnetic tape;

an erasing magnetic head arranged on said predetermined path between said recording magnetic head and said reproducing magnetic head for selectively erasing the video signal recorded on the magnetic head; and

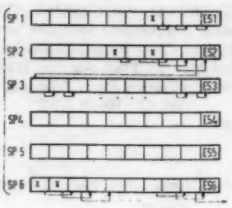
delay means for delaying the video signal reproduced by said reproducing magnetic head by such a time period that a video signal delayed by the delay means is recorded by said recording magnetic head on the magnetic tape at the same position where the relevant video signal is reproduced,

said recording, erasing and reproducing magnetic heads being equidistantly arranged on the rotary drum in sequential order when viewed in a rotational direction of the rotary drum, the magnetic tape being wound helically around the rotary and fixed drums and fed in a direction opposite to the rotational direction of the rotary drum so that a video signal of one field is recorded on the magnetic tape as a single inclined track, said reproducing head being shifted in an axial direction of the rotary and fixed drums with respect to the recording and erasing heads such that the reproducing magnetic head scans a track which is situated at an upper stream position relative to a track which is scanned by the recording and erasing heads when viewed in the feeding direction of the magnetic tape by n tracks (n=1, 2 . . .), and said delay means delaying the video signal by a time period equal to $(n-1+\frac{1}{2})$ fields.

4,706,136
METHOD FOR CONTROLLING A MAGNETIC DISK MEMORY

Peter Wentzel, Augsburg; Erich Huber, Fuerstenfeldbruck; Eckardt Weiss, and Florian Achatz, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich

Filed Mar. 17, 1986, Ser. No. 840,049
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1985, 3509744
Int. Cl.[4] G11B 5/09
U.S. Cl. 360—39 5 Claims



1. A method for controlling a magnetic disk memory which comprises a plurality of magnetic disks seated on a common axis of rotation, each magnetic disk comprising a plurality of concentric storage tracks on their surfaces, the storage tracks of the disks being aligned to form storage cylinders, a plurality of magnetic heads each adjacent a respective disk surface, and a position controller connected to and operable to commonly position the magnetic heads selectively to a respective cylinder, each of the tracks being divided into a plurality of useful sectors and an alternate sector, and each sector comprising a header and a data field each alternate sectors serving as a useful sector in case of a defective useful sector along a track, comprising the steps of:

shifting the information of a defective sector and of the following sectors by one sector to the next up to a following alternate sector; and

reducing the amount of shift after every alternate sector, and increasing the amount of shift at each following defective sector within a cylinder to the next following alternate sector.

4,706,137
HEAD SWITCHING SIGNAL PRODUCING CIRCUIT WITH COMPENSATION OF A PHASE ERROR DUE TO THE POSITIONING OF A ROTARY DRUM HEAD AND A ROTATIONAL PHASE DETECTOR

Hidenori Tanaka, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed May 14, 1986, Ser. No. 863,090
Claims priority, application Japan, May 20, 1985, 60-74492[U]
Int. Cl.[4] G11B 15/14
U.S. Cl. 360—64 6 Claims

1. A head switching signal producing circuit which produces a head switching signal used to switch over signals reproduced from a magnetic tape by at least one pair of rotary heads which are mounted at diametrical positions on a rotational plane of a rotary body, said rotary body being wrapped obliquely with the magnetic tape on an outer periphery thereof for an angular range greater than 180°, said signals from the rotary heads being switched over so that the signal from one of the rotary heads which is scanning the magnetic tape is selectively outputted, said head switching signal producing circuit comprising:

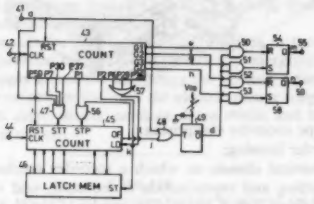
input terminal means supplied with clock pulses;

first pulse generating means for generating a first pulse per one revolution of the rotary body;

second pulse generating means for generating a constant number of second pulses per one revolution of the rotary body, said second pulses having a period dependent on a rotational speed of the rotary body;

first counter means reset by said first pulse for counting said second pulses;

second counter means reset by an output of said first counter means for every one revolution of the rotary body for counting the clock pulses from said input terminal means for a first time period from a time when said first pulse is received to a time immediately thereafter when one of said second pulses is received by said first counter means, and for resuming a counting operation when a counted value in said first counter means becomes a predetermined value so as to produce an overflow signal after the clock pulses



are counted for a second time period, said second time period being one period of said second pulses minus said first time period;

memory means coupled to said second counter means for storing a counted value in said second counter means during said first time period, the counted value in said memory means being read out and loaded into said second counter means before the counted value in said first counter means becomes said predetermined value;

delay circuit means for producing a signal which is delayed by a specific time from a time when said first pulse or said overflow signal is received; and

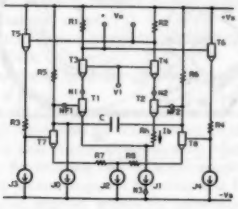
output circuit means coupled to said delay circuit means for producing as said head switching signal a signal having a polarity thereof inverted every time an output signal of said delay circuit means is received.

4,706,138

AMPLIFICATION OF SIGNALS PRODUCED BY A MAGNETIC SENSOR

Stephen A. Jove, Watsonville, and Klaas B. Klaassen, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 14, 1986, Ser. No. 851,649
Int. Cl.[4] G11B *5/02, 5/127*
U.S. Cl. 360—67 **13 Claims**



1. A circuit having first and second power supplies, for simultaneously biasing, and amplifying signals produced by, a magnetoresistive element having a steady-state resistance value, said circuit comprising:

a first current source coupled to the magnetoresistive element and to the second power supply for producing a current therethrough having constant time average value;

an input stage, having at least two transistors coupled in a first differential pair configuration and having the magnetoresistive element coupled to the emitter of one of said first differential pair of transistors and coupled to the first constant current source, for amplifying current deviations from said constant time average value of the current flowing through said magnetoresistive element; and

output means, coupled to the input stage, for correcting variations in input stage voltage levels and for amplifying and transmitting signals received therefrom;

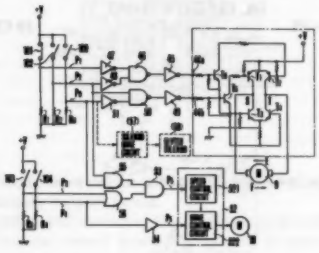
the collectors and bases of the said first differential pair of transistors being coupled to the output means, and the emitter of said other transistor of said differential pair being coupled to the first constant current source.

4,706,139

MAGNETIC RECORDING AND REPRODUCING APPARATUS

Masaya Maeda, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 630,659, Jul. 13, 1984, Pat. No. 4,603,361, which is a continuation of Ser. No. 312,326, Oct. 16, 1981, Pat. No. 4,481,551. This application May 8, 1986, Ser. No. 861,072
Claims priority, application Japan, Oct. 17, 1980, 55-145282
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—71 **6 Claims**



1. A video signal reproducing apparatus for reproducing a video signal from helical tracks formed on a magnetic tape, comprising:

(A) a rotating head drum having a video signal reproducing head which rotates along an outer circumference to said drum;

(B) tape loading means being able to move between a first position for setting a path of said magnetic tape at such a position that the tape moves along and in contact with an outer circumference of said rotating head drum, and a second position for setting the path at such a position as not contacting said outer circumference;

(C) a supply reel for sending out said magnetic tape;

(D) a take-up reel for taking up said magnetic tape;

(E) moving means for moving said magnetic tape between said supply reel and said take-up reel in a lengthwise direction thereof;

(F) detecting means for detecting said tape loading means respectively being at said first position and being at said second position;

(G) movable means for enabling said moving means to move said magnetic tape when said tape loading means is detected by said detecting means at said first position and for making the moving means unable to move the tape when said tape loading means is at the second position;

(H) first, second and third switches which have on/off states thereof respectively determined manually;

(I) loading conrol means for controlling the moving of said tape loading means corresponding to the state of said first switch;

(J) first changeover means for changing over the moving speed of said magnetic tape by said moving means between a first speed and a second speed which is faster than said first speed depending on the state of said second switch when said tape loading means is detected at said first position; and

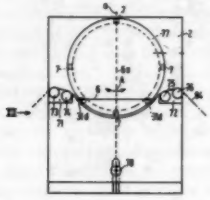
(K) driving means being so arranged as driving said take-up reel when said second switch is turned on irrespective of a position of said tape loading means, and driving said supply reel when said third switch is turned on.

4,706,140

MAGNETIC TAPE THREADING APPARATUS

Johannes C. A. Muller, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1985, Ser. No. 793,887
Claims priority, application Netherlands, Apr. 9, 1985, 8501027
Int. Cl.[4] G11B *15/665*
U.S. Cl. 360—85 10 Claims



1. A magnetic tape threading apparatus for leading a length of magnetic tape from a cassette to a magnetic head which reads or records the tape, comprising

a deck,

a cylindrical drum system on said deck, said system having a rotating magnetic head and a non-rotating drum section, said non-rotating drum section incorporating a positioning element,

a supporting member mounted on said deck for rectilinear movement relative thereto toward and away from said drum system, said supporting member occupying an end position when closest to said drum system,

means carried by said support member for leading a length of magnetic tape toward said drum system when said member is moved theretoward,

at least two mutually spaced tape guides fixed to the supporting member, said tape guides serving to wrap the magnetic tape around a part of the circumference of the drum system when the supporting member is in the end position,

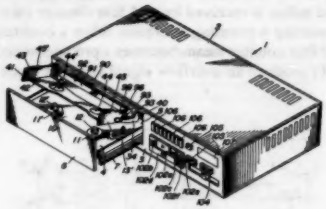
positioning means carried by said supporting member, said positioning means cooperating with said positioning element to position the tape guides relative to the drum system when the supporting member is in the end position.

4,706,141

VIDEO TAPE RECORDER WITH FIRST AND SECOND LOADING POSITIONS

Seisuke Oba; Tsutomu Mikami; Hideyuki Suzuki; Mitsuhiro Shimada, and Tadashi Suzuki, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 8, 1985, Ser. No. 752,733
Claims priority, application Japan, Sep. 29, 1984, 59-206067
Int. Cl.[4] G11B *15/66, 17/04*
U.S. Cl. 360—96.5 27 Claims



1. A tape recorder comprising:

a recorder housing;

a mechanical chassis on which a recorder mechanism for recording and reproduction is mounted, said recording mechanism being adapted to receive a tape cassette including a tape serving as recording medium, wherein said mechanical chassis is able to move horizontally between an eject position in which it protrudes from said recorder housing to receive and eject said tape cassette and a first loading position housed within said recorder housing and in which said tape is received by said recorder mechanism for recording and reproduction and a second loading position to hold said tape cassette so that said tape cassette can be exposed to the outside of said recorder housing and that said tape is maintained at a loaded position for recording and reproduction; and

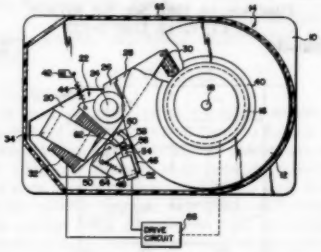
means for driving said mechanical chassis to move between said eject position, said first loading position and said loading position.

4,706,142

MAGNETIC DISK APPARATUS

Toshiaki Hattori, and Machio Shimanuki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Sep. 26, 1985, Ser. No. 780,292
Claims priority, application Japan, Nov. 12, 1984, 59-236718
Int. Cl.[4] G11B *5/54*
U.S. Cl. 360—105 9 Claims



1. A magnetic disk apparatus for recording on and reproducing information from a magnetic disk having a head landing zone, comprising:

a base frame on which a magnetic disk is to be carried;

electric disk drive means mounted on the base frame for rotating the magnetic disk on the base frame;

a magnetic head for recording on and reproducing information from the magnetic disk;

a carriage supporting the magnetic head and disposed on the base frame so as to be movable between a stop position where the magnetic head is located on the head landing zone of the magnetic disk and a position where the magnetic head is located on the outer peripheral edge portion of the magnetic disk;

carriage drive means for driving the carriage;

first urging means for urging the carriage to the stop position thereof;

a lock member disposed on the base frame so as to be movable between an engaged position where the lock member engages the carriage in the stop position to hold the same therein and a disengaged position off the path of travel of the carriage;

second urging means for urging the lock member toward the engaged position thereof;

holding means for holding the lock member in the disengaged position thereof when electrically energized; and

power supply means for energizing the holding means for a predetermined period after the electric power supplied to the disk drive means, carriage drive means and holding means is cut off.

4,706,143

ROTARY HEAD CYLINDER DEVICE WITH FLUID BEARING

Takafumi Asada, Hirakata; Cyuryo Yoshida, Amagasaki; Tadao Shioyama, Sakurai, and Kazuyoshi Kurose, Kitakatsuragi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP83/00322, § 371 Date May 30, 1984, § 102(e) Date May 30, 1984, PCT Pub. No. WO84/01465, PCT Pub. Date Apr. 12, 1984

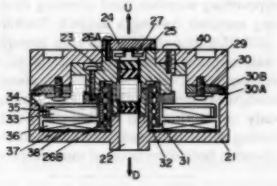
PCT Filed Sep. 30, 1983, Ser. No. 619,143

Claims priority, application Japan, Sep. 30, 1982, 57-172722

The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.

Int. Cl.⁴ G11B *5/52, 21/04, 15/61*

U.S. Cl. 360—107 **5 Claims**



1. A rotary head device having a fluid bearing comprising:

stationary support means;

a shaft having one end thereof fixedly supported by said stationary support means;

rotatable support means rotatably mounted on a free end of said fixed shaft;

at least one magnetic head disposed on said rotatable support means;

a cylindrical rotary transformer means mounted coaxially around said fixed shaft for transmitting an electrical signal to and from said at least one magnetic head;

motor means for rotating said rotatable support means; and

radial bearing means disposed between said fixed shaft and said rotatable support means for preventing shifting of said at least one magnetic head relative to a magnetic tape, said bearing means including a lubricant and a first pattern of herringbone shaped grooves on said fixed shaft or on said rotatable support means at a position near said free end of said fixed shaft and a second pattern of herringbone shaped grooves on said fixed shaft or on said rotatable support means at a position between said first pattern and said fixed end of said fixed shaft, said first pattern having a surface area larger than said second pattern to provide greater bearing rigidity in a radial direction to said free end of said fixed shaft due to the rigidity of a lubricating film between said fixed shaft and said rotatable support means when said rotatable support means is rotated relative to said fixed shaft.

4,706,144

ROTARY HEAD DEVICE WITH FLUID BEARING

Takafumi Asada, Hirakata; Cyuryo Yoshida, Amagasaki; Tadao Shioyama, Sakurai, and Yoshiteru Hosokawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP83/00321, § 371 Date May 30, 1984, § 102(e) Date May 30, 1984, PCT Pub. No. WO84/01464, PCT Pub. Date Apr. 12, 1984

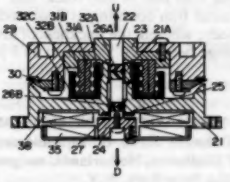
PCT Filed Sep. 30, 1983, Ser. No. 619,147

Claims priority, application Japan, Sep. 30, 1982, 57-172723

The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.

Int. Cl.⁴ G11B *5/53, 21/04*

U.S. Cl. 360—107 **3 Claims**



1. A rotary head device with a fluid bearing comprising:

a stationary support means;

a rotatable shaft extending in a longitudinal direction having a free end thereof rotatably supported in said stationary support means;

rotatable support means fixedly mounted on the other end of said rotatable shaft;

a least one magnetic head disposed on said rotatable support means;

a cylindrical rotary transformer means mounted coaxially around said rotatable shaft for transmitting an electrical signal to and from said at least one magnetic head;

motor means for rotating said rotatable support means; and

bearing means disposed between said rotatable shaft and said stationary support means, said bearing means including a lubricant and a first pattern of herringbone shaped grooves on said rotatable shaft or on said stationary support means at a position near said other end of said rotatable shaft and a second pattern of herringbone shaped grooves on said rotatable shaft or on said stationary support means at a position between said first pattern and said free end of said rotatable shaft, said first pattern differing from said second pattern only in that said first pattern has a length in said longitudinal direction which is greater than the length of said second pattern to provide greater bearing rigidity to said other end of said rotatable shaft due to a lubricating film between said rotatable shaft and said stationary support means, whereby said difference in pattern lengths compensates for differences in the radial loads taken up by said bearing means.

4,706,145

ERASING HEAD

Yasuyuki Hirabayashi, Chiba, and Juro Sugiura, Tokyo, both of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Sep. 23, 1985, Ser. No. 779,251

Claims priority, application Japan, Oct. 1, 1984, 59-147365[U]

Int. Cl.[4] G11B *5/127*

U.S. Cl. 360—118 **5 Claims**

1. An erasing head for erasing magnetic recording medium comprising:

a head body made of a unitary one-piece non-laminated permanent magnetic material having a slider plane having a width, the slider plane facing with recording medium which is subject to erasure;

a part of the width of said slider plane to confront with a track to be erased being magnetized so that said slider plane part has a plurality of magnetic poles and a part of the width of said slider plane being non-magnetized to confront with a portion of the recording medium beyond said track;

said slider plane confronting with recording medium with width larger than that of said track; and

a magnetic metal film covering at least said slider plane of the head body; wherein the thickness of said magnetic film is in the range between 3.5 μm and 33.5 μm.

4,706,146

MAGNETIC HEAD WITH CONCAVE CONTACT FACE

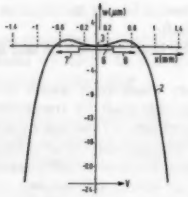
Gerardus M. Dohmen; Jacob G. Fijnvandraat, and Budiman Sastra, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 12, 1985, Ser. No. 775,200

Claims priority, application Netherlands, Sep. 13, 1984, 8402798; Oct. 8, 1984, 8403053

Int. Cl.[4] G11B *5/187*

U.S. Cl. 360—122 **2 Claims**



1. A magnetic head for recording, reproducing and/or erasing magnetic information in a track of a flexible magnetic tape, said head comprising a magnet core provided with a contact face along which the tape can be moved in contact with the magnetic head in a predetermined direction of movement, and with a non-magnetic transfer gap which intersects the contact face, which contact face is curved in said direction of movement on either side of the transfer gap in accordance with a radius of curvature whose value depends upon the distance from the transfer gap, the dimension of the contact face measured transverse to the direction of movement being less than the width of the tape, characterized in that

in a region of the contact face, in which the transfer gap is located, the radius of curvature with which the contact face is curved in the direction of movement increases with an increasing distance from the transfer gap, and the centres of curvature lie above the surface of the contact face in order to form a concave surface;

in the regions of the contact face adjoining that region in which the transfer gap is located, this radius of curvature decreases with an increasing distance from the transfer gap, while the centres of curvature are located below the surface of the contact face in order to form convex surfaces; and

the contact face is curved transverse to the direction of movement into a convex shape.

4,706,147

CASSETTE FOR CLEANING THE HEADS OF A MAGNETIC TAPE RECORDER

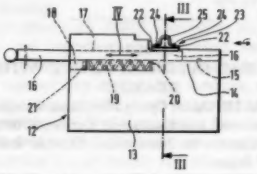
Hans Muller, Silvrettastrasse 14, 7000 Stuttgart 60, Fed. Rep. of Germany

Filed Jul. 9, 1985, Ser. No. 753,228

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1985, 85014079

Int. Cl.[4] G11B *5/41*

U.S. Cl. 360—128 **17 Claims**



1. A cleaning cassette for cleaning a read/write head of a magnetic tape recorder, said cassette comprising:

a cassette body;

a supporting member reciprocally housed in said cassette body, said supporting member having a support surface facing the read/write head of the recorder;

a cleaning device mounted on said support surface for cleaning said read/write head upon reciprocal movement of said supporting member, said cleaning device including a cleaning member having a smooth flexible cleaning surface, said cleaning surface curving generally outwardly from said support surface and having an elasticity such that reciprocal movement of said cleaning member past said read/write head results in said cleaning surface continuously contacting said read/write head and matingly contouring about said read/write head to clean said read/write head in both directions of said reciprocal movement.

4,706,148

MAGNETIC TAPE CASSETTE

Choji Komiyama, and Kengo Oishi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 27, 1985, Ser. No. 769,645

Claims priority, application Japan, Aug. 31, 1984, 59-131372

Int. Cl.[4] G11B *23/04, 15/60*

U.S. Cl. 360—132 **5 Claims**

1. In a magnetic tape cassette of the type having upper and lower half cases which when assembled together define at least one tape drawing opening in a front part of said cassette, through which a magnetic tape can be extracted from said cassette for recording and reproduction, the improvement comprising:

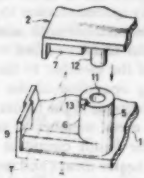
a lower rib (4) protruding from said lower half case adjacent said opening and adapted to confront a bottom edge of the magnetic tape;

a guide (5) having a generally cylindrical shape with an axial bore therein formed integrally with said lower rib and

having a sliding surface (6) adapted to contact a rear surface of the magnetic tape;

an upper rib (7) protruding from said upper half case adjacent said opening and adapted to confront an upper edge of the magnetic tape;

a cassette case wall (9) adapted to confront the front surface of the magnetic tape; and



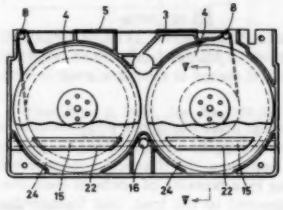
said guide having a recessed portion (13) in an upper peripheral surface thereof and said upper rib being engaged with said recessed portion and extending closer to said axial bore of said guide than said sliding surface, whereby capture of said tape in a gap between said sliding surface and said upper rib is precluded.

4,706,149

TAPE CASSETTE

Tetsuo Machida, and Kazuo Ozawa, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 10, 1985, Ser. No. 774,361
Claims priority, application Japan, Sep. 17, 1984, 59-194507
Int. Cl.⁴ G11B *23/02*; G03B *1/04*
U.S. Cl. 360—132 **5 Claims**



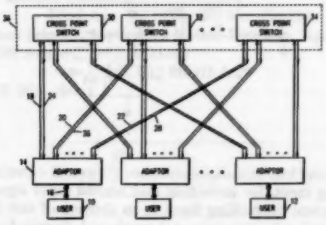
1. In a tape cassette comprising a cassette casing having upper and lower halves molded by injection molding from a synthetic resin, two reels which are mounted for rotation in said cassette casing and have at least lower flanges, and a groove, which is provided in an outer surface of a bottom wall of said lower half of the casing with at least a part of said groove being present in a region of the bottom wall of said lower half that is adjacent each of said lower flanges of said two reels, the improvement comprising at least a first projection being formed on at least a portion of an inner surface of the bottom wall of said lower half to overlie at least a part of said groove and each of said two reels having at least a second projection being formed near an outer periphery of its lower flange, said second projection of each reel moving in a separate circular path during rotation of the reels, said first projection being subdivided into two longitudinally extending portions with one portion for each reel and each portion having a position and length to be received in the circular path of the second projection of a respective reel, said portion of the first projection facilitating flow of a molten resin injection near said groove during molding of the lower half.

4,706,150

SWITCHING PROTOCAL FOR MULTIPLE AUTONOMOUS SWITCHING PLANES

Gerald Lebizay, White Plains; Yeong-Chang L. Lien, Briarcliff Manor, and Philip S. Yu, Pleasantville, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 626,511, Jun. 29, 1984, abandoned. This application Nov. 21, 1986, Ser. No. 933,309
Int. Cl.⁴ H04Q *11/00, 5/00*; H04M *3/00*
U.S. Cl. 340—825.5 **13 Claims**



1. A switching method of establishing connections between users for a switching system that establishes multiple simultaneous comunications paths through multiple autonomous switching planes for a single transmission by a user issuing substantially simultaneous connection requests to each of said switching planes, comprising the steps of:

determining which of said connection requests for multiple simultaneous communication paths have been successfully completed, with a conflict situation existing if one or more of said requests have been completed on one or more of said switching planes but not all of said requests have been completed on all of said multiple switching planes;

issuing retry requests in a conflict situation to all planes on which said connection requests have not been completed, said retry requests being issued according to a conflict protocol, said determining and issuing steps being performed by a user that had issued said uncompleted connection requests; and

honoring said retry requests according to said protocol, said honoring causing previously completed connections to be disconnected, said honoring being performed by the switching planes to which said retry requests had been issued.

4,706,151

POWER LIMITER FOR ELECTRICAL CONTACTS

William J. Roberts, Toledo, Ohio, assignor to Allied Corporation, N.J.

Filed Apr. 11, 1985, Ser. No. 722,239
Int. Cl.⁴ H02H *3/24*
U.S. Cl. 361—6 **6 Claims**

1. An electric contact circuit comprising, in combination:

a voltage source;

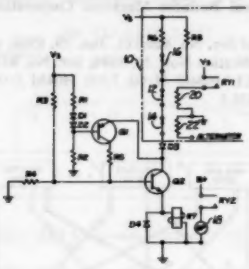
a pair of electrical contacts exhibiting a voltage;

an electrical load in series with said voltage source and electrical contacts;

current controller means, in series with said electrical contacts, for limiting current through said electrical contacts, said current controller means having a current controlling input for receiving first and second input signals thereon, said current controller means limiting current through said electrical contacts in response to said second input signal;

a first bias circuit, interconnected to said electrical contacts and said current controlling input, for sensing said voltage across said electrical contacts and providing said first input signal to said current controlling input of said cur-

rent controller means in response to sensing a low voltage across said electrical contacts, whereby current may flow substantially unimpeded through said electrical contacts; and



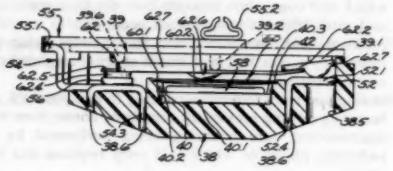
a second bias circuit, interconnected to said current controlling input, for providing said second input signal to said current controlling input in an absence of said first input signal, whereby current through said electrical contacts is substantially reduced.

4,706,152

PROTECTED REFRIGERATOR COMPRESSOR MOTOR SYSTEMS AND MOTOR PROTECTORS THEREFOR

Pietro DeFilippis; Ciro Calenda, both of Aversa, and Giuseppe Notaro, D'Arco, all of Italy, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 4, 1985, Ser. No. 794,913
Claims priority, application Italy, Mar. 15, 1985, 47818 A/85
Int. Cl.[4] H02H *5/04, 7/08*
U.S. Cl. 361—32 **19 Claims**



1. A current and temperature responsive motor protector to be mounted in a selected manner on an electrical motor for providing short time trip and ultimate trip portection for the motor comprising

a base,

first contact means mounted on the base normally in a first position engaging complementary contact means to close a motor circuit, the first contact means being movable to a second position to disengage the complementary contact means and open the circuit, and

thermostat metal means mounted on the base to be disposed in selected thermal coupling to the motor when the protector is mounted on the motor in said manner, the thermostat metal means being actuatable when heated to a selected temperature to move the first contact means to said second open circuit position,

characterized in that

the thermostat metal means comprises a dished thermostat metal member movable with snap action from an original dished configuration to an inverted dished configuration when heated to a precisely predetermined actuating temperature while substantially free of externally applied forces, the member being mounted on the base unattached to any support to be substantially free of such externally applied forces prior to said snap action and having one side of the member disposed to engage and move the first contact means to open the circuit as the member moves on occurrance of said snap action when heated to said precisely predetermined actuating temperature, the member being mounted out of the motor circuit so motor current does not pass through the member, and

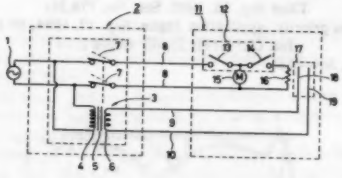
separate electrical resistance heater means responsive to changes in the motor current are proportioned and arranged in closely spaced relation to an opposite side of the thermostat metal member with selected thermal coupling to the thermostat metal member to cooperate with thermal coupling of the member to the motor for permitting normal running operation of the motor in response to normal motor currents in the heater means and for heating the thermostat metal member to said actuating temperature to open the motor circuit in response to increased currents in the heater means and motor on the occurrence of either short time trip and ultumate trip fault conditions in the motor.

4,706,153

LEAKAGE DETECTING DEVICE FOR ELECTRICAL APPLIANCE

Yoshinori Sainomoto, and Nobuteru Maekawa, both of Hikone, Japan, assignors to Matsushita Electric Works Ltd., Osaka, Japan

Filed Jun. 4, 1986, Ser. No. 870,705
Claims priority, application Japan, Jun. 25, 1985, 60-141057
Int. Cl.[4] H02H *3/00*
U.S. Cl. 361—42 **12 Claims**



1. A leakage detecting device which detects leakage when a power source supplies voltage through a plug to a load in an electrical appliance, the electrical appliance being connected to the plug by a plurality of cords, at least one of said cords being connected to the load, said leakage detecting device comprising:

a pair of electrodes contained within said appliance and being electrically independent of the load, a remainder of said plurality of cords being connected to said pair of electrodes, and

relay means contained within said plug and including at least one contact for supplying the voltage from said power source through said plug to the load, said contact being opened so as to stop supplying the voltage from said power source through said plug to the load when said pair of electrodes is in a short-circuited state;

wherein said relay means comprises a core, a primary coil wound around said core and connected to a terminal of said plug so that magnetic flux is generated in said core when said power source supplies said voltage, a secondary coil wound around said core and connected to said pair of electrodes so that magnetic flux is generated to cancel the magnetic flux generated in said core by said primary coil when said pair of electrodes is in a short-circuited state, and a movable core normally in an open position and moved to a closed position in response to said magnetic flux being generated by said secondary coil, said at least one contact being opened when said movable core is

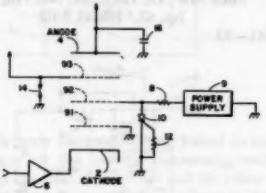
closed, thereby stopping the supply of voltage from said power source through said plug to the load.

4,706,154

CIRCUIT ARRANGEMENT FOR PROTECTING A CRT AND ASSOCIATED CIRCUITRY FROM DAMAGE DUE TO ARCING

Bruce K. Baur, Milwaukie, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 15, 1985, Ser. No. 798,658
Int. Cl.[4] H02H *9/04*
U.S. Cl. 361—56 **7 Claims**



1. In cathode-ray tube apparatus that includes a cathode-ray tube having an anode, a cathode, and at least one grid electrode intermediate said anode and cathode, means for protecting said tube and its associated circuitry from damage caused by inter-electrode arcing, comprising

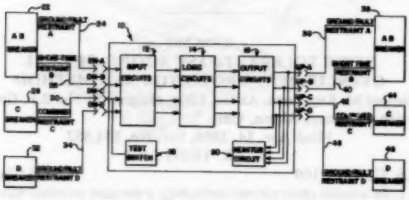
a silicon controlled rectifier connected between said grid electrode and a common reference potential, said rectifier as thus connected being nonconductive during normal operation of said apparatus but becoming conductive when the potential difference between said grid and reference potential increases at a rate exceeding the established dv/dt rating for said rectifier.

4,706,155

RESTRAINT SIGNAL INTERFACE CIRCUIT

Leon W. Durivage, Marion, and Ronald L. Farrington, Cedar Rapids, both of Iowa, assignors to Square D Company, Palatine, Ill.

Filed Mar. 6, 1985, Ser. No. 708,927
Int. Cl.[4] H02H *3/04*
U.S. Cl. 361—64 **13 Claims**



1. In an alternating current electrical distribution system utilizing a plurality of protective circuit breakers spaced along the stream of the distribution system from a source of supply to a plurality of separate loads, a restraint signal interface circuit for selectively providing upstream restraint signals for circuit breakers upstream thereof dependent on the state of downstream restraint signals, said interface circuit comprising:

(a) means for pairing a produced upstream restraint signal with each received downstream restraint signal, each pair of restraint signals having the same electrical parameters and carrying the same type of at least one of ground fault and short-time information; said means for pairing comprising:

(b) means for indicating when said received downstream restraint signals are active to indicate said information;

(c) means for selecting between said received at least ground fault and short-time information; and

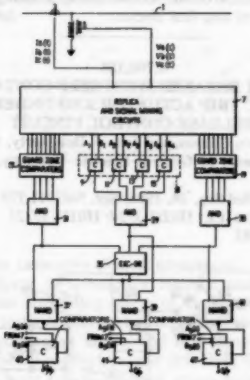
(d) means for combining said electrical parameters and selected information to be carried to produce said upstream restraint signals.

4,706,156

PROTECTION APPARATUS

Benjamin R. J. Caunce, Hixon, England, assignor to The General Electric Company, p.l.c., England

Filed Apr. 10, 1986, Ser. No. 850,134
Claims priority, application United Kingdom, Apr. 17, 1985, 8509858; Aug. 27, 1985, 8521306
Int. Cl.[4] H02H *3/26*
U.S. Cl. 361—80 **8 Claims**



1. A distance relay for indicating single phase to ground faults in a polyphase electric power transmission system comprising: means for generating in respect of each phase of the system a first guard zone quadrilateral characteristic including a reactance line; and means for generating in respect of each phase of the system a second main quadrilateral characteristic including a reactance line; the slope of the reactance line of each guard zone characteristic changing its slope under two-phase to ground fault conditions by a lesser amount than the reactance line of the corresponding main characteristic; and the relay indicating the presence of a fault on a single phase to ground within the reach of the main characteristic relating to the relevant phase only if the corresponding guard zone characteristic, and no other, indicates a fault.

4,706,157

SEMICONDUCTOR INTERGRATED CIRCUIT

Yukihiko Shimazu, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1986, Ser. No. 871,548
Claims priority, application Japan, Jun. 13, 1985, 60-130205
Int. Cl.[4] G01R *15/12*
U.S. Cl. 361—86 **7 Claims**

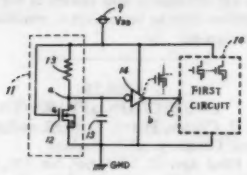
1. A semiconductor integrated circuit comprising:

a supply potential receiving means for receiving a first potential and a second potential different from a common reference potential, and reference receiving means for receiving said reference potential;

a first circuit coupled to said supply potential receiving means to be operable upon supply of either one of said first and second potentials to said potential receiving means;

a second circuit coupled to said supply potential receiving

means to be inoperable upon supply of said first potential to said supply potential receiving means and operable upon supply of said second potential to said supply potential receiving means; and



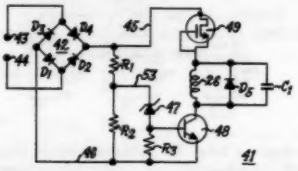
a transmission circuit coupled between said first circuit and said second circuit to transmit a signal to said first circuit upon operation of said second circuit to change an operating mode of said first circuit.

4,706,158

CIRCUIT BREAKER WITH SELF-CONTAINED ELECTRONIC TRIP ACTUATOR AND UNDERVOLTAGE RELEASE CONTROL CIRCUIT

Frank A. Todaro, Clinton, and John J. Dougherty, Avon, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Sep. 24, 1986, Ser. No. 911,179
Int. Cl.[4] H02H *3/24;* H01H *47/28*
U.S. Cl. 361—92 **10 Claims**



1. A circuit breaker with self contained electronic trip actuator comprising:

a molded plastic circuit breaker cover and a molded plastic circuit breaker case;

a pair of separable contacts within said case electrically connected in series within a protected electric circuit and controlled by an operating mechanism to separate said contacts upon the occurrence of an overcurrent condition through said protected electric circuit;

an electronic actuator within said circuit breaker case and operatively arranged with said operating mechanism for articulating said operating mechanism to separate said contacts, said electronic actuator including a magnetic latch arranged for holding a mechanical actuator against the bias of a charged spring, said magnetic latch including an undervoltage coil providing magnetic flux to hold said mechanical actuator in a non-actuating position; and

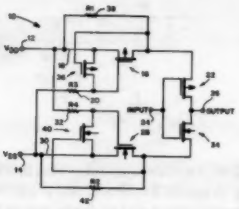
an electronic undervoltage release control circuit within said circuit breaker case connected with said undervoltage release coil and including a rectifier having an output connected across a positive and a negative bus and an input connected with an undervoltage release signal, a voltage divider across said positive and negative bus having one leg connected to the base of a transistor switch through a zener diode having a predetermined clamping voltage, said one leg developing a test voltage across said zener diode representative of voltage across said protected circuit, said undervoltage coil being connected in series with an emitter and collector of said transistor switch and in series with a field effect transistor, said field effect transistor keeping series current through said undervoltage coil at a constant value, said zener diode becoming non-conductive when said test voltage is less than said predetermined clamping voltage to thereby turn off said transistor switch and de-energize said undervoltage release coil.

4,706,159

MULTIPLE POWER SUPPLY OVERCURRENT PROTECTION CIRCUIT

Warren G. Hafner, Lake Carmel, N.Y., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 12, 1985, Ser. No. 710,795
Int. Cl.[4] H02H *9/02*
U.S. Cl. 361—93 **10 Claims**



1. A circuit for preventing a short circuit in a device which has a first and second power supply; the circuit comprising

a first switch means connected to the first power supply;

a first voltage sense means connected to the first switch means, a second switch means connected to the second power supply;

a second voltage sense means connected to the second switch means;

first biasing means for coupling the second power supply voltage to the first switch means;

second biasing means for coupling the first power supply voltage to the second switch means; and

an output buffer which is electrically connected to the first and second switch means, the first sense means after sensing an excessive voltage disconnecting the first power supply from the buffer, the second sense means after sensing an excessive voltage disconnecting the second power supply from the buffer.

4,706,160

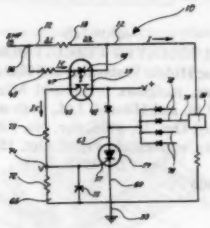
NOISE TOLERANT FAST ACTING OPTICAL OVERCURRENT PROTECTOR AND METHOD

Michael M. Kugelman, Akron, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed Apr. 14, 1986, Ser. No. 851,852
Int. Cl.[4] H02H *3/08*
U.S. Cl. 361—100 **6 Claims**

1. In a solid state circuit including a current conduit having a corresponding supply voltage and at least one current consuming switching device including a control electrode means and configured to conduct electrical current to a load, an overcurrent protector configured for action therein in less than one microsecond comprising: a sensing means and crowbar means, the sensing means being configured for triggering the crowbar means; the sensing means including an optical coupler having anode, cathode, collector and emitter electrodes, a primary resistor positioned in the current conductor of a size configured to produce a predetermined sensing means triggering voltage drop across the primary resistor when current flowing therethrough exceeds a desired value; a means whereby the anode and cathode of the optical coupler are subjected to a voltage drop across the primary resistor; the

crowbar device having anode, cathode and gate eletrodes, the crowbar device gate electrode and the optical coupler emitter electrode being joined through a voltage divider circuit with the voltage divider circuit being joined to a point of low reference voltage in the solid state circuit; one of the crowbar



device anode and cathode electrodes being joined to the control electrode means for the current consuming/switching devices contained in the solid state circuit and the other crowbar device electrode being connected to a voltage in the solid state circuit.

4,706,161

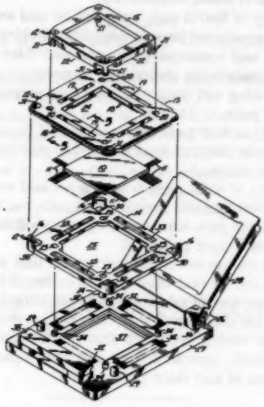
DEVICE PROTECTIVE APPARATUS

John S. Buckingham, Roanoke, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 17, 1986, Ser. No. 931,675

Int. Cl.[4] B65D *73/02*; H01H *47/00*

U.S. Cl. 361—220 **47 Claims**



1. A protective apparatus for devices having electrically conductive, substantially coplanar terminal leads extending outward therefrom, said apparatus comprising:

a base member of a first material and having first and second major surfaces on opposite sides thereof with there being a first insert opening extending between said base member first and second major surfaces;

a holding member of a second material and having a first major surface such that said holding member can by selection be removably positioned against said base member to permit constraining therebetween those terminal leads of such a said device so that those terminal leads would, as a result, be between said base member first major surface and said holding member first major surface; and

a positionable shorting member of an electrically conductive third material, said positionable shorting member being engaged with said base member such that a first shorting portion of said positionable shorting member can by selection be positioned to extend through said first insert opening from said base member second major surface past said base member first major surface but also, as an alternative, be positioned so that said first shorting portion is short of extending through said first insert opening past said base member first major surface.

4,706,162

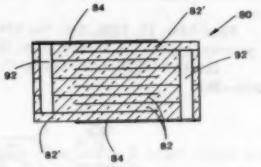
MULTILAYER CAPACITOR ELEMENTS

Jorge M. Hernandez, Mesa, and Aleta Gilderdale, Chandler, both of Ariz., assignors to Rogers Corporation, Rogers, Conn.

Continuation of Ser. No. 890,489, Jul. 25, 1986, Pat. No. 4,667,267, which is a continuation-in-part of Ser. No. 811,673, Dec. 20, 1985, Pat. No. 4,626,958, which is a continuation of Ser. No. 693,189, Jan. 22, 1985, abandoned. This application Jan. 12, 1987, Ser. No. 2,221

Int. Cl.[4] H01G *1/14, 4/10*

U.S. Cl. 361—306 **14 Claims**



1. A multilayer capacitive element comprising:

interleaved layers of conductive material and dielectric material with alternating layers of conductive material being electrically connected and defining first and second groups of conductive layers, said first group having at least one exposed conductive layer defining a first exposed conductive layer and said second group having at least one exposed conductive layer defining a second exposed conductive layer, said first and second groups of conductive layers being mutually parallel to each other;

said dielectric material including a pair of opposed end surfaces and top and bottom surfaces;

said first group of conductive layers being spaced from one of said opposed end surfaces of said dielectric material and said second group of conductive layers being spaced from the other of said opposed end surfaces of said dielectric material;

a first via through said dielectric material electrically interconnecting said first group of conductive layers and a second via through said dielectric material electrically interconnecting said second group of conductive layers;

said first via extending parallelly into said dielectric material from said first exposed conductive layer; and

said second via extending partially into said dielectric material from said second exposed conductive layer.

4,706,163

CAPACITOR WITH DIELECTRIC OF PLZT AND AN INTERGRANULAR BORATE

Galeb H. Maher, North Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Feb. 25, 1987, Ser. No. 18,635

Int. Cl.[4] H01G *4/12*; C04B *35/46*

U.S. Cl. 361—321 **10 Claims**

1. A ceramic capacitor comprising a sintered glass-ceramic dielectric body and two spaced apart electrodes in contact with said dielectric body, said body being composed of (A) an antiferroelectric lead zirconate phase wherein from 0.07 to 0.16 molar parts of said lead are replaced with lanthanum and wherein from 0.10 to 0.40 molar parts of said zirconate are

replaced by titanate, and (B) a glass phase amounting to from 0.1 to 0.9 weight percent of said body, said glass phase consisting essentially of a borate selected from cadmium lead borate,

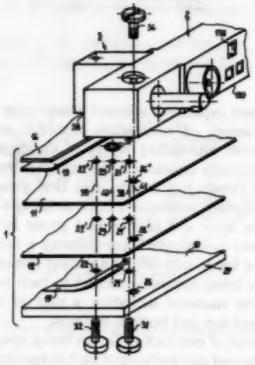
cadmium aluminum lead borate, zinc lead borate, zinc aluminum lead borate and combinations thereof, said lead having been volatilized from said PLZT phase and gettered by said glass phase during sintering.

4,706,164

PRINTED CIRCUIT CARD WITH HEAT EXCHANGER AND METHOD FOR MAKING SUCH A CARD

Patrick L'Henaff, Colomiers, and Herve Bricaud, Toulouse, both of France, assignors to Amphenol Corporation, Wallingford, Conn.

Filed Mar. 11, 1986, Ser. No. 838,485
Claims priority, application France, Mar. 18, 1985, 85 03970
Int. Cl.[4] H02B *1/00*; H05K *7/20*
U.S. Cl. 361—382 **20 Claims**



1. A printed circuit board assembly, said assembly comprising:

a printed circuit board having circuits thereon:

an electrical connector connected to said board;

said connector including a fluidic contact including means for passage of a cooling liquid therethrough, and

a heat drain attached to said board which provides a built-in heat-exchanger for said board, said heat drain comprising:

a first plate having an upper surface and a lower surface.

a network of channels integrally formed in said first plate and extending from said upper surface towards said lower surface and terminating before said lower surface, said channels being adapted to circulate said cooling liquid;

a closure plate extending over said first plate, said closure plate having an upper surface and a lower surface;

at least one orifice extending through said closure plate from its upper surface to its lower surface, said orifice being in communication with said passage means of said fluidic contact;

an integration and sealing layer located between said first plate and said closure plate and connecting and sealing said plates together, said integration and sealing layer having an upper surface and a lower surface; and

at least one orifice extending through said integration and sealing layer from its upper surface to its lower surface, said orifice in said integration and sealing layer being in communication with said orifice of said closure plate and said channels of said first plate,

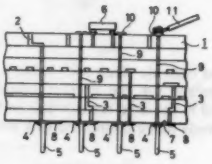
whereby a path for said cooling liquid extends from said fluidic contact to said channels to thereby provide an integral heat-exchanger for said printed circuit board.

4,706,165

MULTILAYER CIRCUIT BOARD

Takaji Takenaka; Hideki Watanabe, and Haruhiko Imada, all of Hadano, Japan, assignors to Hitachi Microcomputer Engineering Co., Ltd. and Hitachi, Ltd., both of Tokyo, Japan

Filed Oct. 15, 1986, Ser. No. 918,918
Claims priority, application Japan, Oct. 15, 1985, 60-229296
Int. Cl.[4] H05K *1/18*
U.S. Cl. 361—403 **4 Claims**



1. A multilayer circuit board comprising:

a first principal plane having a plurality of first pads connected to electronic components and a plurality of second pads connected to said plurality of first pads, respectively;

a second principal plane having a plurality of third pads arranged in a plurality of rows and connected to a plurality of I/O leads, respectively;

a plurality of fourth pads arranged on said second principal plane connected to said plurality of third pads, respectively, said connection between said third pads and said fourth pads being electrically separable;

a first wiring net for connecting said second pads to said fourth pads;

a plurality of fifth pads arranged on said first principal plane so as to be electrically connected to said first pads via first discrete wires;

a plurality of sixth pads arranged on said second principal plane between said rows of third pads, each of said plurality of sixth pads corresponding to a predetermined plurality of said third pads; and

a second wiring net connected to said fifth and sixth pads;

wherein one of said third pads is connected to said corresponding one of said sixth pads via second discrete wires, such that said one of said third pads is connected to said second wiring net when said one of said third pads is electrically separated from said fourth pad connected to said one of said third pads.

4,706,166

HIGH-DENSITY ELECTRONIC MODULES—PROCESS AND PRODUCT

Tiong C. Go, El Toro, Calif., assignor to Irvine Sensors Corporation, Costa Mesa, Calif.

Filed Apr. 25, 1986, Ser. No. 856,835
Int. Cl.[4] H05K *7/10, 7/12*
U.S. Cl. 361—403 **17 Claims**

1. A method for fabricating a module containing high-density electronic circuitry, comprising:

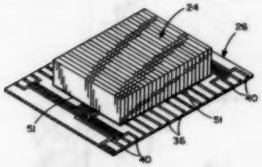
providing a plurality of integrated circuit chips, each having a multiplicity of closely-spaced electrical leads at an access side thereof;

stacking and bonding the integrated circuit chips in a structure having an access plane which includes the access sides of the stacked chips, on which plane there is a two-dimensional array of closely-spaced electrical leads;

forming on the access plane, in electrical contact with the leads a plurality of conductive lines and a plurality of conductive terminals;

providing a substrate adapted to support the stacked chips and having printed thereon circuitry including a plurality of conductive lines and a plurality of conductive terminals;

the conductive terminals on the access plane being located in precise matched relationship with the conductive terminals on the substrate;



covering either the substrate or the access plane with a layer of insulation having openings therethrough matched to the conductive terminals thereon;

depositing electrically conducting bonding bumps on the conductive terminals of both the access plane and the substrate;

aligning the bonding bumps on the substrate with those on the access plane; and

using heat and/or pressure to bond the aligned bonding bumps together, thereby providing a plurality of spaced electrical connections between the access plane and the substrate.

4,706,167

CIRCUIT WIRING DISPOSED ON SOLDER MASK COATING

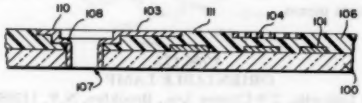
Donald F. Sullivan, 56 W. White Oak Rd., Paradise, Pa. 17562, assignor to Telemark Co., Inc., Gap, Pa.

Continuation-in-part of Ser. No. 681,686, Dec. 14, 1984, which is a continuation-in-part of Ser. No. 550,379, Nov. 10, 1983, Pat. No. 4,528,259. This application Dec. 17, 1985, Ser. No. 809,767

The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.

Int. Cl.[4] H05K *1/11*

U.S. Cl. 361—406 **37 Claims**



1. In a printed wiring board assembly having an insulation photopolymer resist coating such as a solder mask layer disposed to extend upwardly from a conductive circuit wiring pattern on a printed wiring board substrate surface to cover a substantial portion of the substrate surface while leaving exposed through a resist coating conductor pads at predetermined circuit contact positions on the substrate surface, the improvement comprising in combination providing increased efficiency of circuit space usage with given board substrate dimensions thereby permitting additional circuit board patterns to be printed without increasing the substrate area, namely, a thin conductive circuit pattern on the substrate surface, said insulation resist coating consisting of a cured liquid photopolymer with a glossy flush surface formed by contact of a flat plate with the polymer in liquid form which is adhered to the substrate surface and presents a flush flat surface plateau with access channels downwardly extending thereinto to expose the conductor pads on the substrate surface and having a thin conductive coating on the channel sidewalls electrically contacting the exposed conductor pads, and a layer of conductive material disposed on the surface of said insulation coating in a pattern with controlled electronic coupling to the circuit board wiring pattern.

4,706,168

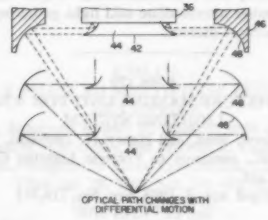
SYSTEMS AND METHODS FOR ILLUMINATING OBJECTS FOR VISION SYSTEMS

Ralph M. Weisner, Canoga Park, Calif., assignor to View Engineering, Inc., Simi Valley, Calif.

Filed Nov. 15, 1985, Ser. No. 798,632

Int. Cl.[4] G03B *15/02*

U.S. Cl. 362—18 **18 Claims**



1. A system for illuminating a target object with focused light at varying angles of incidence relative to an optical axis and comprising:

a ring light source concentric with the optical axis and providing a hollow cylinder of light directed toward the object;

a first ring reflector having an outer surface of parabolic cross section in a path of the cylinder of light and reflecting the light into an outwardly disbursing pattern;

a second ring reflector having an inner surface of curved cross section disposed about the first ring reflector and concentric therewith in a path of the pattern reflected from the first ring reflector; and

means for varying the spacing of the first and second ring reflector from the object, including means for moving the second ring reflector differentially relative to the first.

4,706,169

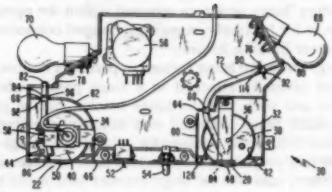
LIGHTING SYSTEM FOR APPLIANCE DIALS

Marc R. Bussan, Knights Township, Vanderburgh County, and Sylvester A. Winternheimer, Center Township, Vanderburgh County, both of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 8, 1986, Ser. No. 939,151

Int. Cl.[4] G01D *11/28*

U.S. Cl. 362—26 **31 Claims**



1. For use in a refrigerator having a cabinet defining a compartment and a light source for illuminating said compartment, an illuminated dial comprising:

a cylindrical control knob comprising a circular base and a

peripheral wall extending axially from the circumference of said base and defining an interior surface and an exterior surface, said peripheral wall being partially translucent and bearing indicia spaced around the translucent portion of said control knob and visible from the exterior of the knob when said interior surface is illuminated;

a shaft, supported by a portion of said cabinet, to rotatably mount said control knob in said cabinet with a portion of said exterior surface visible and accessible to a user;

an elongated transparent lightpipe member, having a light-gathering surface adjacent said light source and a light output end adjacent said peripheral wall interior surface, said lightpipe member being formed to avoid contact with said peripheral wall and said shaft; and

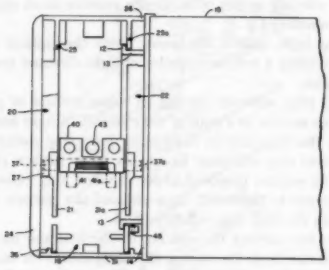
a bracket means supported by said cabinet for receiving and non-rotatably and non-translatably supporting said lightpipe member intermediate said light gathering and light output surfaces thereof.

4,706,170

LIGHTING FIXTURE HANGER UNIT FOR A MODULAR LIGHTING SYSTEM

Douglas J. Herst, Ross, and Henry H. Iwahashi, El Cerrito, both of Calif., assignors to Peerless Lighting Corporation, Berkeley, Calif.

Filed Apr. 3, 1985, Ser. No. 719,361
Int. Cl.[4] F21S *3/00*
U.S. Cl. 362—217 **14 Claims**



1. A lighting fixture hanger unit having at least one port for hanging a linear lighting fixture which has at least one end plate and a flanged connector ring projecting outwardly from said end plate, said hanger fixture unit comprising

a top housing having an exterior surface,

a bottom portion, and

at least one fixture connection port formed in part by said top housing in at least one side of said hanger unit, said port presenting a shaped perimeter for meeting with the end of a correspondingly shaped linear lighting fixture,

said fixture connection port including a radially inwardly extending flange structure recessed within the opening of said port for lockingly engaging a flanged connector ring of a linear lighting fixture,

said flange structure being formed in part by a bottom hinge bracket pivotally attached to a hinge point within said hanger unit such that the hinge bracket can be pivoted downward from a closed end connector engagement position to an open position for receiving a flanged connector ring projecting from an end plate of a linear lighting fixture, said bottom hinge bracket forming at least in part the structure of the bottom portion of said hanger unit, and

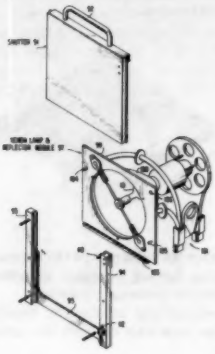
means within said hanger unit and accessible through the bottom portion thereof for releasably locking said bottom hinge bracket in its closed end connector engagement position.

4,706,171

CONTAINMENT SHIELD FOR A REPLACEABLE XENON LAMP AND REFLECTOR MODULE

Paul H. Ruterbusch, Liverpool, N.Y., assignor to General Electric Company, Princeton, N.J.

Filed Aug. 25, 1986, Ser. No. 900,109
Int. Cl.[4] F21V *19/04*
U.S. Cl. 362—254 **4 Claims**



1. In an image projection system which uses an arc lamp and reflector as a light source, wherein the improvement comprises:

guide assembly on said projection system, said guide assembly including a pair of parallel guide members with facing grooves;

a replaceable lamp module including mount means for supporting said arc lamp and reflector, said mount means being removably received by said facing grooves;

a containment shutter for selective mating engagement with said mount means, said shutter including first locking means for releasably securing said shutter to said mount means; and

second locking means on said guide assembly for automatically engaging said mount means of said module upon the withdrawal of said shutter from said grooves, said second locking means being released upon the insertion of said shutter into said grooves and the engagement of said first locking means, thereby allowing the withdrawal of said module with said shutter in mating engagement with said mount means.

4,706,172

ORIENTABLE LAMP

Samuel Lebowitz, 278 Clinton Ave., Brooklyn, N.Y. 11205

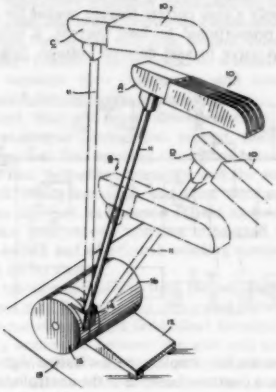
Filed Mar. 27, 1986, Ser. No. 844,625
Int. Cl.[4] F21V *21/26*
U.S. Cl. 362—270 **6 Claims**

1. An adjustable lamp comprising:

A. a light housing provided with a bulb-receiving socket having input terminals and a bulb in said socket;

B. an extensible arm cantilevered from a base to support said housing, said arm being constituted by parallel electrically-insulated flexible metal tapes that are connected to the socket terminals to form a two-wire line leading to the bulb, each tape being ensheathed by a thin film of flexible plastic material bonded to the metal surface thereof, said tapes being wound on a common rotatable reel mounted for rotation in a casing which is angularly adjustable relative to the base to change the angle of the arm and hence that of the bulb housing, whereby said arm may be lengthened or shortened to change the elevation of the housing relative to the base, said tapes being arched to resist flexure and being in superposed relation to form a

structural beam to support the housing so that the superposed arched tapes do not flex even when fully extended despite the load imposed thereon by the housing; and

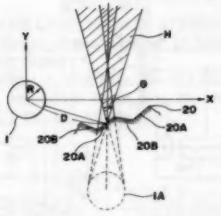


C. means to supply power to the tapes in the reel to energize the bulb through the two-wire line.

4,706,173
LIGHTING APPARATUS

Hiroshi Hamada, Yamatokoriyama; Kiyoshi Nakazawa, Fujiidera; Hiroshi Take, Ikoma; Naofumi Kimura, Nara, and Fumiaki Funada, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 20, 1986, Ser. No. 831,258
Claims priority, application Japan, Feb. 22, 1985, 60-35003; Jun. 28, 1985, 60-142751
Int. Cl.[4] F21V *7/00*
U.S. Cl. 362—341 **10 Claims**



1. In a lighting apparatus including a tubular light source having a longitudinal axis and a member having a plurality of reflective surfaces for reflecting light from said light source, the improvement comprising:

a plurality of other surfaces;

said reflective surfaces being angularly arranged such that between each said reflective surface a said other surface is provided, said reflective surfaces and said other surfaces alternating to form a continuous element of said member, said reflective surfaces having an adjacent other surface associated therewith to form a pair of surfaces, said reflective and other surfaces having a major dimension parallel to the longitudinal axis of the tubular light source, said reflective surfaces being arranged such that light from said light source is reflected in a predetermined direction by each of said reflective surfaces; and

a passive display unit disposed in front of said member said display unit lying in a plane;

each said pair of surfaces having an end-to-end distance measured along a selected parallel to said plane of said display unit;

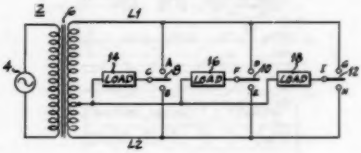
each of said reflective surfaces having an end-to-end width measured along said selected parallel to said plane of said display unit;

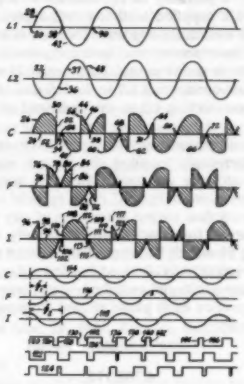
a ratio of said end-to-end width of said reflective surfaces to said end-to-end distance being selected to be a function of a distance between said light source and each of said reflective surfaces.

4,706,174
SINGLE PHASE TO MULTIPHASE FREQUENCY MULTIPLIER

Herman P. Schutten; Robert W. Sackett, both of Milwaukee; Jan K. Sedivy, Elm Grove, and Michael E. Taken, Cedarburg, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 29, 1982, Ser. No. 402,866
Int. Cl.[4] H02M *5/02*
U.S. Cl. 363—9 **10 Claims**





1. A single to multiphase frequency conversion technique for an AC signal supplied to a pair of power lines L1 and L2 by an AC source, comprising alternately switching between said power lines by first switching to L1 and then switching to L2 and then switching back to L1 and so on at a plurality of sets of irregular times at any point in the AC cycle to yield a plurality of chopped sinusoid switched output waveforms each of any given up-converted output frequency phase shifted from each other.

4,706,175

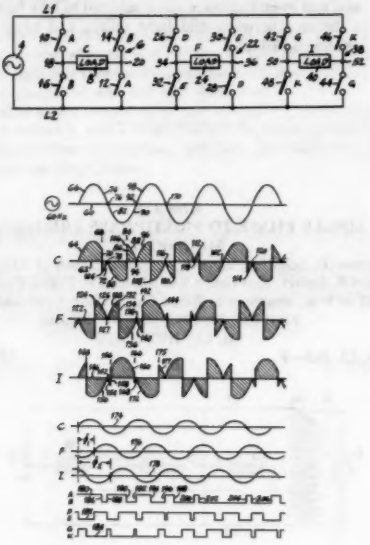
SINGLE PHASE TO POLYPHASE BRIDGE-TYPE FREQUENCY MULTIPLIER

Herman P. Schutten; Robert W. Sackett, both of Milwaukee; Jan K. Sedivy, Elm Grove, and Michael E. Taken, Cedarburg, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 29, 1982, Ser. No. 402,864

Int. Cl.[4] H02M *5/02*

U.S. Cl. 363—9 **12 Claims**



1. In an AC circuit having multiphase load means connected respectively by a plurality of H-switches to a pair of power lines L1 and L2 supplied with an AC signal from an AC source, each H-switch having one ON state connecting L1 to the left end of its respective said load and connecting L2 to the right end of its respective said load, each H-switch having another ON state connecting L2 to the left end of its respective said load and connecting L1 to the right end of its respective said load,

a single to multiphase frequency conversion technique comprising alternately toggling the first of said H-switches between said one and said other ON state at irregular times at any point in the AC cycle to yield a first chopped sinusoid switched output waveform of any given up-converted output frequency, and alternately toggling each remaining H-switch between said one and said other ON states at respectively delayed but irregular times to yield one or more additional switched output waveforms of said given frequency each phase shifted from said first output waveform.

4,706,176

CLOCKED DIRECT VOLTAGE CONVERTER

Hans-Jürgen Kettschau, Eckenhaid, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 7, 1986, Ser. No. 882,800

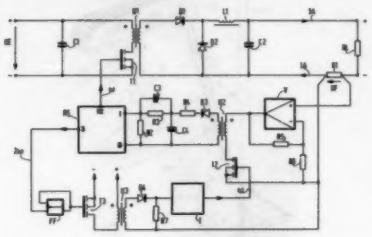
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1985, 3524767

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—21 **15 Claims**

13. A direct voltage converter comprising:

a pair of input terminals for a source of d.c. voltage, a first transformer having a primary and a secondary winding, means coupling the primary winding to said input terminals, a switching transistor coupled to the primary winding so as to switch current from said input terminals through the primary winding, a control circuit including an oscillator, means coupling said secondary winding to a load to supply a load current thereto, means for deriving a voltage proportional to load current, a controllable switch responsive to said derived voltage, first voltage



isolation means for coupling an oscillation signal of the oscillator to a control electrode of the controllable switch so that the controllable switch chops said derived voltage independent of the duty cycle of the switching transistor, and second voltage isolation means for coupling the chopped voltage to a control input of the control circuit whereby the control circuit supplies to a control electrode of the switching transistor a switching control voltage whose duty cycle is a function of the load current.

4,706,177

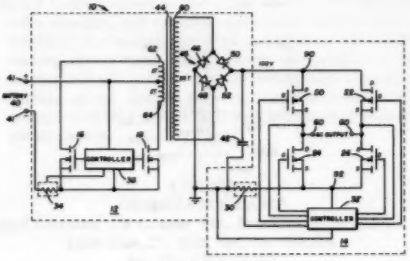
DC-AC INVERTER WITH OVERLOAD DRIVING CAPABILITY

Elliot Josephson, 150 Josselyn La., Woodside, Calif. 94062

Filed Nov. 14, 1985, Ser. No. 797,834

Int. Cl.[4] H02M *3/335;* **H02H** *7/122*

U.S. Cl. 363—24 **6 Claims**



1. An inverter circuit for converting a low voltage DC source into a higher voltage output AC source generated between first and second AC output terminals, comprising:

means for converting said low voltage DC source into a higher second DC voltage source including a positive node and a negative return node;

bridge converter means including first, second, third and fourth field-effect transistors for converting said second DC voltage source into an output AC source, each of said first, second, third and fourth field-effect transistors including gate, source and drain terminals, the drain of said first transistor connected to said positive node, said source of said first transistor connected to said first output AC terminal and to said drain of said second field-effect transistor, the source of said second field-effect transistor

connected to said negative return node, the drain of said third field-effect transistor connected to said positive node, the source of said third field-effect transistor connected to said second AC output terminal and to the drain of said fourth field-effect transistor, and a source of said fourth field-effect transistor connected to said negative return node, said bridge converter means further comprising means for driving said first, second, third and fourth field-effect transistor for periodically translating said transistors between their conducting and non-conducting states, said driving means comprising:

first, second, third and fourth driver switches;

a first transformer having first, second, third and fourth windings, said first winding connected between the gate of said first field-effect transistor and the source of said first field-effect transistor, said third winding connected between the gate and source of said second field-effect transistor, said second winding connected to said first driver switch and said fourth winding connected to said second driver switch;

a second transformer having first, second, third and fourth windings, said first winding connected between the gate and source of said third field-effect transistor, said third winding connected between the gate and source of said fourth field-effect transistor, said second winding connected to said third driver switch and said source winding connected to said fourth driver switch;

such that when a respective first, second, third or fourth driver switch means turns on, current is caused to flow through its associated said winding so as to create a voltage drop in a respective winding connected to a field effect transistor gate sufficient to cause said field-effect transistor to switch from a non-conducting to a conducting state; and

control means for providing control signals to said first, second, third and fourth driver switches in a predetermined sequence such that a quasi-square wave is generated across said AC output terminals; and

means for detecting an AC output overcurrent condition and for disabling said bridge converter means as a predetermined function of the amplitude and time duration of said overcurrent condition.

4,706,178

POWER CONVERSION SYSTEM

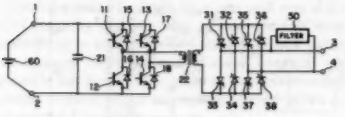
Shigeo Hayashi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 6, 1986, Ser. No. 871,382

Claims priority, application Japan, Sep. 20, 1985, 60-206321

Int. Cl.[4] H02M 7/44

U.S. Cl. 363—98 **1 Claim**



1. A power conversion system comprising:

(a) an inverter for retransforming d.c. power into high-frequency a.c. power through switching operations of semiconductor switches forming a bridge circuit;

(b) a high-frequency transformer for changing the voltage of the a.c. power produced by said inverter;

(c) a semiconductor rectifier for rectifying the output of said high-frequency transformer in synchronism with the output of said inverter; and

(d) a control circuit for controlling the switching operation of said inverter and said semiconductor rectifier so that said semiconductor rectifier produces an output voltage having a sinusolidal waveform;

(e) said control circuit comprising:

(1) pulse transformers for supplying control signals to said inverter in response to a switching signal provided by an oscillation circuit;

(2) a logical negating circuit for reversing the polarity of said switching signal;

(3) a counter for counting the output of said logical negating circuit;

(4) a ROM device for storing control signals to said semiconductor rectifier and supplying a control signal by being addressed by the output of said counter; and

(5) pulse transformers for supplying the output of said ROM device to said semiconductor rectifier.

4,706,179

ARRANGEMENT FOR SWITCHING RECTIFIED ALTERNATING CURRENT

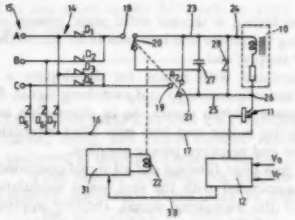
Sidney B. Smith, Hemel Hempstead, England, assignor to Lucas Industries Plc, Birmingham, England

Filed Sep. 25, 1986, Ser. No. 911,973

Claims priority, application United Kingdom, Nov. 19, 1985, 8528501

Int. Cl.[4] H02M 7/06

U.S. Cl. 363—126 **5 Claims**



1. An arrangement for switching rectified alternating current, comprising a rectifier arrangement having input terminals for an a.c. input and first and second terminals for direct current, said rectifier arrangement has a third direct current terminal and comprises rectifier elements connected so that first and second currents flowing through said second and third terminals respectively are discontinuous and that the sum of said first and second currents can provide a substantially continuous rectified output, and switch means operable between a first state in which said second and third terminals are commonly connected to a supply terminal for a load and a second state in which said second and third terminals are isolated from each other and from said supply terminal.

4,706,180

PULSE WIDTH MODULATED INVERTER SYSTEM FOR DRIVING SINGLE PHASE A-C INDUCTION MOTOR

Frank E. Wills, York, Pa., assignor to York International Corporation, York, Pa.

Filed Nov. 29, 1985, Ser. No. 803,028

Int. Cl.[4] H02M 7/538

U.S. Cl. 363—132 **12 Claims**

1. A pulse width modulated inverter system for supplying single phase a-c power to a single phase a-c induction motor, comprising:

a positive power supply for providing a positive d-c voltage of fixed magnitude;

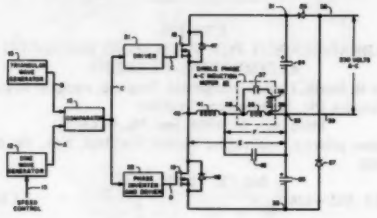
a negative power supply for providing a negative d-c voltage of the same fixed magnitude;

means for developing a sinusoidally weighted pulse width modulated switching signal having a high switching frequency and a single phase sine wave modulation component representative of the desired a-c signal to be applied

to the motor, the switching frequency of said switching signal being very high relative to that of the sine wave modulation component;

a low pass filter having an inductance coil, connected in series with the motor, and a capacitor, connected in parallel with the motor, said low pass filter having the capability of filtering out high frequency signal components associated with the switching signal and passing along those components associated with the sine wave modulated component of the switching signal;

means, including a first solid state power switch, for coupling the motor and low pass filter across the positive power supply;



means, including a second solid state power switch, for coupling the motor and low pass filter across the nagative power supply; and

means, coupled with means for developing a switching signal and responsive to said switching signal, for turning said power switch means on in alternation in order to couple the motor and low pass filter alternately to the positive and negative power supplies,

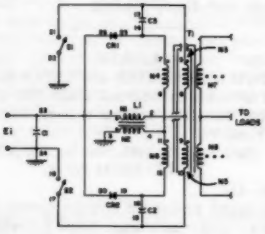
said low pass filter filtering out all signal components except those associated with the sine wave modulation conponent of the switching signal, thereby applying to the motor single phase sinusoidal voltage having a frequency equal to the frequency of the sine wave modulation component of the switching signal.

4,706,181

SWITCHING CONVERTER WITH ENHANCED VOLTAGE CLAMPING AND ENERGY RECOVERY

Larry N. Mercer, Bountiful, Utah, assignor to Unisys Corporation, Blue Bell, Pa.

Filed Feb. 2, 1987, Ser. No. 10,067
Int. Cl.[4] H02M 7/538
U.S. Cl. 363—133 **2 Claims**



1. A power converter comprising

reference level means,

means for supplying D.C. input power across first and second input terminals, wherein said second input terminal is coupled to said reference level means,

secondary output winding means for supplying power output from said power converter,

first and second primary windings each having first and second primary terminals, said first primary terminals being coupled together to form a common primary terminal,

first auxiliary winding means inductively coupled to said first primary winding means having first and second auxiliary terminals and being wound with the same winding polarity as said first primary winding means,

second auxiliary winding means inductively coupled to said second primary winding means and having third and fourth auxiliary terminals and being wound with the same winding polarity as said second primary winding means, wherein said second and fourth auxiliary terminals are coupled together to form a common auxiliary terminal and said first and second auxiliary winding means are wound with opposite winding polarities relative to each other with respect to said common auxiliary terminal,

first choke winding means having first and second choke terminals wherein said first choke terminal is coupled to said first input terminal and said second choke terminal is coupled to said common primary terminal,

second choke winding means inductively coupled to said first choke winding having a third and fourth choke terminals, wherein said third choke terminal is coupled to said second input terminal and said fourth choke terminal is coupled to said common auxiliary terminal, said first and second choke winding means being wound with the same winding polarity,

first capacitive means coupled between said second primary terminal of said first primary winding and said first auxiliary terminal,

second capacitive means coupled between said second primary terminal of said second primary winding and said third auxiliary terminal,

first electrical switch means having at least first and second switch terminals coupled between said second primary terminal of said first primary winding and said reference level means,

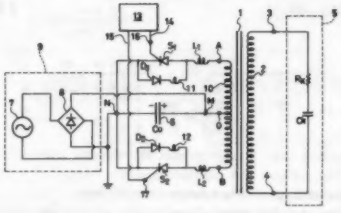
and second electrical switch means is coupled beteen said second primary terminal of said second primary winding means and said reference level means.

4,706,182

RF HIGH-VOLTAGE POWER SUPPLY

Senichi Masuda, 3-2-1-415, Nishigahara, Kita-ku, Tokyo, Japan

Filed Dec. 30, 1986, Ser. No. 947,814
Claims priority, application Japan, Jan. 10, 1986, 61-3040
Int. Cl.[4] H02M 7/519
U.S. Cl. 363—139 **14 Claims**



1. An RF high-voltage power supply comprising:

an RF step-up transformer having a primary winding that receives a lower voltage and has a tap, the transformer further having a secondary winding that delivers a higher voltage between its both output terminals;

a power capacitor connected with a charging DC power supply and having one end connected to the tap of the primary winding and the other end connected with both ends of the primary winding;

a first series combination of an oscillating inductor and

anti-parallel combination of an externally controlled switching device that conducts when the capacitor discharges and a diode, one end of the primary winding being connected in series with the first combination;

a second series combination of an oscillating inductor and anti-parallel combination of an externally controlled switching device that conducts when the capacitor discharges and a diode, the other end of the primary winding being connected in series with the second combination; and

a control power supply for supplying control signals alternately to the control terminals of the externally controlled switching devices to alternately bring the switching devices into conduction.

4,706,183

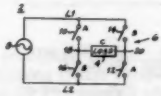
BRIDGE-TYPE FREQUENCY MULTIPLIER

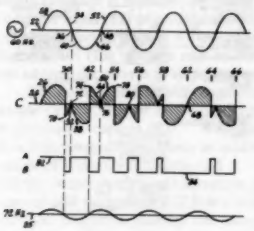
Herman P. Schutten; Robert W. Sackett, both of Milwaukee; Jan K. Sedivy, Elm Grove, and Michael E. Taken, Cedarburg, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 29, 1982, Ser. No. 402,862

Int. Cl.[4] H02M 5/02

U.S. Cl. 363—157 **10 Claims**





1. In an AC circuit having a load connected by an H-switch to a pair of power lines L1 and L2 supplied by an AC soruce, said H-switch having one ON state connecting L1 to the left end of said load and connecting L2 to the right end of said load, said H-switch having another ON state connecting L2 to the left end of said load and connecting L1 to the right end of said load,

a frequency conversion technique comprising alternately switching said H-switch between said one and said other ON states by first stitching to said one ON state and then switching to said other ON state and then switching back to said one ON state and so on at irregular times at any point in the Ac cycle to yield a chopped sinusoid switched output waveform of any up-converted given output fundamental frequency.

4,706,184

FRACTIONAL FREQUENCY MULTIPLIER

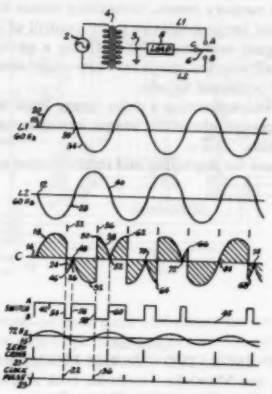
Herman P. Schutten; Robert W. Sackett, both of Milwaukee; Jan K. Sedivy, Elm Grove, and Michael E. Taken, Cedarburg, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 29, 1982, Ser. No. 402,861

Int. Cl.[4] H02M 5/02

U.S. Cl. 363—157 **8 Claims**

1. A frequency conversion technique for an AC signal supplied to a pair of power lines L1 and L2 by an AC source, comprising alternately switching between L1 and L2 by first switching to L1 and then switching to L2 and then switching back to L1 and so on at irregular times to yield a switched output waveform of a given fundamental frequency, said



switched output waveform comprising a chopped sinusoid switched at any point in the AC cycle to yield any up-converted output frequency.

4,706,185

APPARATUS FOR DISPLAYING ULTRASONIC IMAGE

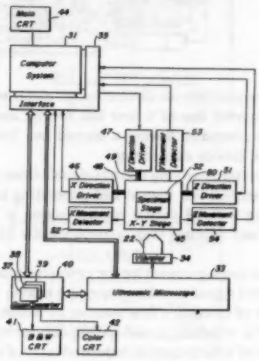
Kouichi Karaki, Hino, and Fumio Uchino, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed May 5, 1986, Ser. No. 859,926

Claims priority, application Japan, May 14, 1985, 60-102042

Int. Cl.[4] G01S 9/68; G01N 29/04

U.S. Cl. 367—110 **6 Claims**



1. An apparatus for displaying ultrasonic images of a specimen picked-up by an ultrasonic microscope comprising:

means for focusing an ultrasonic beam of an ultrasonic microscope to a focal point;

means for detecting a position of said focal point with respect to a specimen, and for generating respective X, Y and Z positional signals indicative of said detected position;

input port means for receiving a plurality of ultrasonic images successively supplied from the ultrasonic microscope;

memory means for storing at least two ultrasonic images

successively received at said input port means, in respective image memories;

means for writing each of said at least two ultrasonic images into said memory means, comprising means for selecting one of said image memories under control of said Z positional signal, and means for selecting a storage position within said selected image memory under control of said X and Y positional signals;

means for reconstructing a color image from said at least two successive ultrasonic images stored in said memory means; and

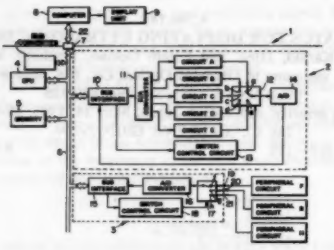
display means for displaying said reconstructed color image.

4,706,186

INTEGRATED CIRCUIT DEVICES

Takao Mogi, and Masahiko Morizono, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 28, 1985, Ser. No. 751,981
Claims priority, application Japan, Jul. 13, 1984, 59-145657
Int. Cl.⁴ G05B *23/02*; G06F *11/30, 13/38*
U.S. Cl. 364—136 **7 Claims**



1. An integrated circuit device for an electronic equipment having an internal bus of a first bus format and adapted for control by a computer having a second bus format, the integrated circuit device comprising:

a bus converter receiving control signals from said computer in said second bus format and generating control signals including a serial digital control signal in said first bus format and placing said control signals on said internal bus;

a digital-to-analog converter for converting said series digital control signal to a corresponding analog control signal;

a plurality of circuits, a first number of which are subject to control in response to said analog control signal, a second number of which operate independently of said computer, and all said circuits for performing specific functions;

a switch circuit for selecting any one of said plurality of circuits;

a switch control circuit for controlling said switch circuit to select any one of said plurality of circuits according to a received selection signal;

an analog-to-digital converter for converting an output signal from said switch circuit into a corresponding digital signal; and

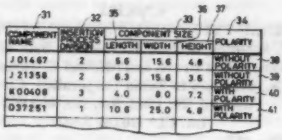
a bus interface circuit for sending said serial digital control signal from said internal bus to said digital-to-analog converter and for sending said selection signal to said switch control circuit.

4,706,187

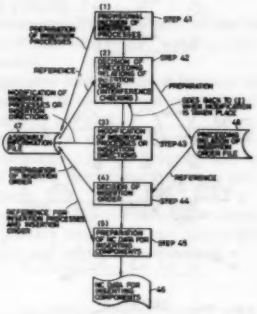
METHOD OF AND APPARATUS FOR PREPARING NUMERICAL CONTROL DATA FOR INSERTING COMPONENTS

Yoshinao Arai; Shino Takahashi, both of Yokohama; Eigo Oikawa, Katsuta; Shigeru Sato, and Hideaki Kobayashi, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 16, 1985, Ser. No. 787,928
Claims priority, application Japan, Feb. 22, 1985, 60-32875
Int. Cl.⁴ H05K *3/30*
U.S. Cl. 364—191 **9 Claims**



COMPONENT NAME	INSERTION POSITION DESIGNATION	COMPONENT SIZE LENGTH	WIDTH	HEIGHT	POLARITY	
J 01467	2	5.6	15.6	4.8	WITHOUT POLARITY	38
J 21358	2	6.3	15.6	3.6	WITHOUT POLARITY	39
K 00408	3	4.0	8.0	7.2	WITH POLARITY	40
037251	1	10.8	25.0	4.8	WITH POLARITY	41



1. An apparatus for preparing numerical control data for inserting components comprising:

a storage means for storing assembly information including a board information record and component records as many as the number of components to be inserted into a board, and component information relating to components to be used, for an individual board;

an input means for entering the assembly information and the component information;

a display means for displaying results of processings;

an output means for outputting the numerical control data prepared; and

a processor means for preparing the numerical control data by, at first, provisionally deciding insertion processes on a basis of said assembly information and the component information, then, checking possible mechanical interference, when inserting the component, between an insertion head and other components to be inserted by prior insertion machines and by the same insertion machine, after that, preparing preceding relations of insertion order according to the results of the interference checking, then, deciding insertion order according to the preceding relations of insertion order, and finally, preparing said numerical control data for automatically inserting said components.

4,706,188

METHOD AND APPARATUS FOR READING SAMPLES OF A TIME-DEPENDENT SIGNAL IN A DATA PROCESSING SYSTEM

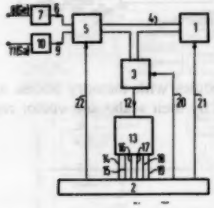
Alois Rainer, Villach, Austria; Walter Ulbrich, Pucheim, and Lajos Gazsi, Bochum, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 6, 1985, Ser. No. 698,854

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1984, 3409800

Int. Cl.[4] G06F *12/02*

U.S. Cl. 364—200 10 Claims



1. A method for processing samples of a time-dependent signal in a data processing system comprising an arithmetic unit (1), a control unit (2), a memory (3) which is connected to said arithmetic unit (1) with a bus line (4) and a first address modification unit (13) which is mounted between said control unit (2) and an address input (12) of said memory (3), comprising the steps of (a) producing during a first phase, with said address modification unit (13) outputs and address sequences whose individual addresses traverse in steps a range of memory locations (Z1 . . . Z5) having prescribed range limits (Z1,Z5), (b) writing a sample (Y1 . . . Y5) of said time-dependent signal into each of the memory locations (P1 . . . P5) thus addressed, (c) outputting in a following second phase an address sequence such that said range of memory locations (Z1 . . . Z5) is cyclically traversed in the respectively same direction in a plurality of runs so that one of said range limits (Z1) is reached after the beginning of the first run,(d) replacing the sample which is stored under the address (Z12) which is the oldest of the samples written during the first phase by writing a further sample (Y6), (e) shifting following each run when a respective individual address (Z23) is reached from run to run by one step relative to the last-mentioned range limit (Z1), (f) replacing by writing the sample (Y2) stored unit this address as the respectively oldest sample written in the first phase which still remains with a further sample (Y7), (g) reading the other memory locations (P1 . . . P5) addressed within all runs of the second phase in cyclical sequence and (b) supplying the readout samples to the arithmetic unit (1).

4,706,189

SPECIAL PURPOSE PERIPHERAL CIRCUIT AND METHOD OF CONNECTING THE SAME TO A COMPUTER

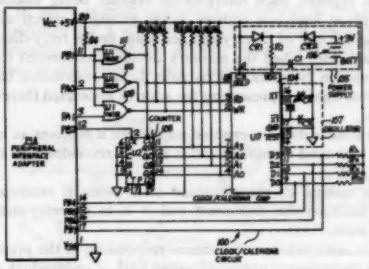
David M. Brockman, 11648 Military Rd. South, Seattle, Wash. 98168

Filed Jun. 27, 1985, Ser. No. 750,730

Int. Cl.[4] G06F *3/00*

U.S. Cl. 364—200 6 Claims

1. A computer system including a general-purpose computer having an output port and a peripheral connected to the computer by way of the output port, said computer having an internal peripheral interface circuit and means for controlling the peripheral interface circuit to provide data generated by use of the computer to the output port for conveyance to the peripheral, the improvement comprising a special-purpose peripheral circuit connected directly to the peripheral interface circuit internally of the computer without normally interfering with the provision of data from the computer to the output port, said special-purpose circuit having means for



generating special-purpose data, and means for enabling said special-purpose data to be conveyed to said computer by way of the peripheral interface circuit.

4,706,190

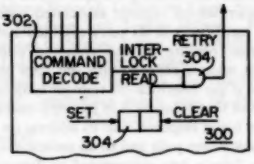
RETRY MECHANISM FOR RELEASING CONTROL OF A COMMUNICATIONS PATH IN DIGITAL COMPUTER SYSTEM

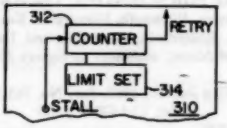
Frank C. Bomba, Andover, and Stephen R. Jenkins, Acton, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 534,720, Sep. 22, 1983, abandoned. This application Jul. 16, 1985, Ser. No. 755,952

Int. Cl.[4] G06F *13/42*

U.S. Cl. 364—200 4 Claims





1. For connection to a common communications path in a data processing system, which path carries data signals that represent data being read or written, the path including address lines for carrying signals that designate memory location from which data are to be read, command lines for carrying commands, including interlock-read commands that request that data be read from a memory location designated by the address signals and unlock-write commands that request that data be written into a memory location designated by the address signals, and response lines for carrying one of at least three response signals, namely, an acknowledgement signal, a no-acknowledgement signal that results when no device places

signals on the response lines, and a retry signal, a memory device comprising:

A. acknowledgement means including at least one interlock-bit register, each interlock-bit register being associated with at least one address, being arranged selectively to assume one of a retry-enabled state and a retry-disabled state, and, when the memory device is connected to the common communications path, being responsive to address signals representing the address associated therewith to:

(i) assume its retry-enabled state when it receives an interlock-read command and it is in its retry-disabled state; and

(ii) assume its retry-disabled state when it receives an unlock-write command and it is in its retry-enabled state,

said acknowledgement means responding to the presence on the common communications path of an interlock-read command and an address associated with any included interlock-bit register thereof to:

(i) place retry signals on the common communications path when the interlock-bit register associated with the address signals on the common communications path is in its retry-enabled state; and

(ii) place acknowledgement signals on the common communications path when the interlock-bit register associated with the address signals on the common communications path is in its retry-disabled state; and

B. a plurality of memory locations for containing data, each memory location associated with an address and, when the memory device is connected to the common communications path:

(i) being responsive to the presence on the common communications path of the address associated therewith, to an interlock-read command, and to the state of the interlock bit associated with the address of that memory location to place on the common communications path data signals representing the data stored in that location if the interlock-bit register associated with the address of that location is in its retry-disabled state and to refrain from placing on the common communications path via signals representing the data stored in that location if the interlock-bit register associated with the address of that location is in its retry-enabled state, and

(ii) further being responsive to its address on the common communications path and to an unlock-write command to store therein data represented by data signals carried by the common communications path.

4,706,191

LOCAL STORE FOR SCIENTIFIC VECTOR PROCESSOR

James R. Hamstra, Plymouth; Howard A. Koehler, Minneapolis; John T. Rusterholz, Roseville, and David J. Tanglin, Anoka, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 31, 1985, Ser. No. 761,135

Int. Cl.[4] G06F *3/00*

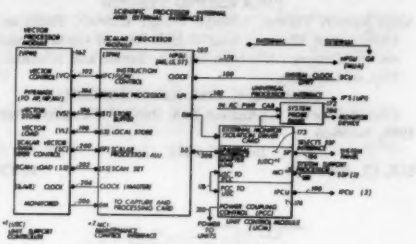
U.S. Cl. 364—200 **14 Claims**

3. A local storage structure for use in a scientific data processing system which system includes a high performance main storage unit and a scientific processor having a scalar processor module and a vector processor module, said local storage structure comprising:

a single memory cycle access local store means organized as and of a similar configuration to the high performance main storage unit;

first interface means coupled between said general purpose, single memory cycle access, local store means and said high performance main storage unit to provide data transfer therebetween;

and second and third interface means including further means for coupling said single memory cycle access local store means to the scalar and vector processor modules of the scientific processor to provide said scalar and vector



processor modules with memory access at a rate equal that provided by their scalar and vector registers.

4,706,192

INPUT APPARATUS FOR ENTERING BASE SEQUENCE INFORMATION OF THE GENE

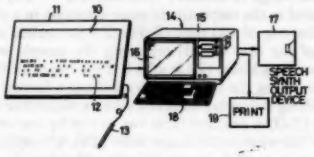
Hisanori Nasu; Satoru Suzuki, both of Yokohama; Hiroaki Yoshida, Tokyo; Tomoichi Fukuda, Tenryu, and Eiichi Soeda, Mishima, all of Japan, assignors to Hitachi Software Engineering Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1985, Ser. No. 727,762

Claims priority, application Japan, Apr. 27, 1984, 59-85929; Mar. 13, 1985, 60-26025

Int. Cl.[4] G06F *15/42*

U.S. Cl. 364—413 **4 Claims**



1. An input apparatus for entering base sequence information of a gene from a film which has a plurality of sequences of bands imaged thereon in correspondence with the base sequence of the gene, said input apparatus comprising:

a computer for analyzing the base sequence of the gene;

digitizer means comprising pointing means for pointing out one band of said plurality of sequence of bands, and entering means for entering into said computer coordinate values of the one band which is pointed out by pointing means on the film;

effective range setting means for entering into said computer coordinate values of points which surround an effective range for each of a plurality of kinds of bases, said computer comparing the coordinate values which are entered by said entering means and the coordinate values which are entered by said effective range setting means so as to convert the coordinate values which are entered by said entering means into a base code for representing one of said plurality of kinds of bases; and

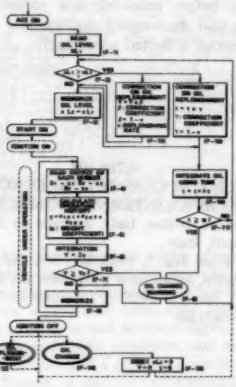
speech sounding means supplied with the base code from said computer for sounding speech corresponding to the base code supplied from said computer.

4,706,193

OIL DEGRADATION WARNING SYSTEM

Minoru Imajo, Yokohama, and Tsunehiro Kawakita, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 11, 1986, Ser. No. 828,358
Claims priority, application Japan, Feb. 12, 1985, 60-23549; Sep. 5, 1985, 60-194866
Int. Cl.[4] G06F *15/20*; F01M *11/10*
U.S. Cl. 364—424 14 Claims



1. An oil degradation warning system for a motor vehicle, comprising:

first means for detecting respective values of degradation factors of oil, said degradation factors being closely related to the operation history of the motor vehicle;

second means for adding the detected values by using a predetermined calculation formula and integrating the added values with passage of time;

third means for issuing a warning signal when the integrated value exceeds a predetermined limit; and

fourth means which, when oil replenishment is carried out, postpones the issue of the warning signal by a period corresponding to the ratio of the replenished oil to the entire amount of the oil.

4,706,194

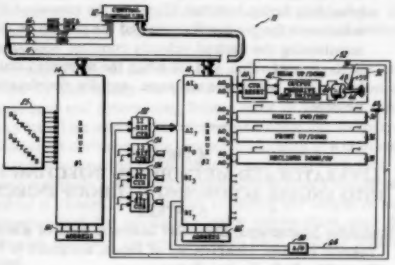
MULTIPLEX CONTROL SYSTEM FOR MEMORY SEAT OR THE LIKE LOAD

Nathaniel Webb, Detroit, and David L. Juzswik, Dearborn Heights, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Dec. 13, 1985, Ser. No. 808,702
Int. Cl.[4] B60N *1/02*; G06F *15/20*
U.S. Cl. 364—424 22 Claims

1. In a control system having a central controller, a plurality of peripheral devices operatively connected in communication with said central controller and input and output signals being provided between said central controller and various ones of said plurality of peripheral devices, a first one of said peripheral devices including a motor for varying a characteristic of said device in a time-dependent manner in response to an output signal from said central controller, means for providing signals indicative of variations in said characteristic of said first one of said peripheral devices, the central controller including memory means for storing a target value and an actual value of said variable characteristic of said first one of said peripheral devices, an other one of the peripheral devices being manually actuable to provide a recall input command signal and said central controller including means responsive to said recall input command signal for providing said output signal to said motor of said first one of said peripheral devices for varying said characteristic thereof in a manner to attain said target value stored in said memory means, the improvement wherein the control system further comprises:

one or more remote controllers connected to the central controller by a serial multiplex data link, each of said plurality of peripheral devices being connected to said central controller via said remote controllers, and



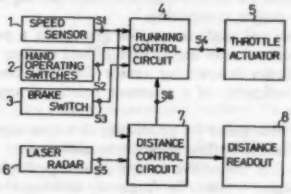
said central controller means being responsive to said recall input command signal for comparing said actual value with said target value of said variable characteristic to determine a difference value, for determining an interval which approximates the time required for said motor to vary said device variable characteristic by said difference value, and for applying said output signal to said motor for the duration of said interval by latching said output signal at said remote controller.

4,706,195

SPEED CONTROL SYSTEM FOR A MOTOR VEHICLE

Yasuhisa Yoshino, Okazaki; Yoshiyuki Kago, Nishio; Hiroyuki Sakakibara, Hekinan, and Yoshio Shinoda, Nukata, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Jun. 12, 1985, Ser. No. 744,058
Claims priority, application Japan, Jun. 15, 1984, 59-123951
Int. Cl.[4] G06F *15/50*
U.S. Cl. 364—426 11 Claims



1. A speed control system for a motor vehicle comprising:

means for determining a velocity of said motor vehicle;

running control means for automatically controlling running equipment of said motor vehicle to maintain said velocity of said motor vehicle at a desired velocity;

means for determining a proper distance apart from any preceding vehicle in response to said velocity of said motor vehicle, and for determining a proximate distance, shorter than said proper distance;

means for detecting if a preceding vehicle is present and measuring a distance apart from the preceding vehicle if one is detected;

means for detecting at a certain time interval, a proximity with respect to the preceding vehicle by a change in said measured distance, said measured distance decreasing

greater than a predetermined rate to indicate said proximity; and

distance control means for maintaining said proper distance apart from the preceding vehicle by: (1) when said meaured distance is above said proper distance, and said proximity to the preceding vehicle is continuously detected for a plurality of time intervals, temporarily reducing said desired velocity to a reduced desired velocity and increasing the desired velocity after a time of no such proximity being detected, (2) when the measured distance is between the proper distance and the proximate distance, maintaining the desired velocity constant with no change at its present value, and (3) when the measured distance is below the proximate distance, rapidly decelerating the vehicle.

4,706,196

APPARATUS AND METHOD FOR INJECTING FUEL INTO ENGINE ACCORDING TO GROUP INJECTION SYSTEM

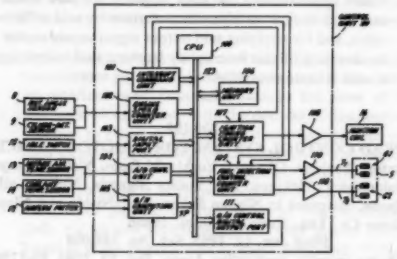
Toshihiko Muramatsu; Shigenori Isomura, both of Kariya, and Takashi Harada, Hekinan, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 8, 1985, Ser. No. 763,795

Claims priority, application Japan, Aug. 10, 1984, 59-168706

Int. Cl.[4] F02D *5/02*

U.S. Cl. 364—431.05 **5 Claims**



1. Apparatus for controlling fuel injection, for an internal combustion engine, comprising:

(a) a rotational angle sensor for generating a pulse signal synchronized with the rotation of said engine;

(b) a cylinder-determining sensor for producing a pulse signal indicative of a reference rotational angle of said engine;

(c) an airflow meter for producing an output signal indicative of intake airflow sucked into said engine;

(d) a flip-flop responsive to said pulse signal synchronized with engine rotation for frequency dividing the same;

(e) a charge-discharge circuit arranged to start charging in response to an output signal from said flip-flop with a first time constant and to start discharging in response to an invesion of said output signal from said flip-flop with a second time constant, one of said first and second time constants being variable in accordance with said output signal from said airflow meter, said charge-discharge circuit having means for producing a basic injection pulse whose width is defined by a period of time required for discharging;

(f) computing means responsive to said basic injection pulse, said pulse signal from said cylinder-determining sensor, and said pulse signal from said rotational angle sensor;

for generating plural groups of final injection pulse signals to be respectively fed to respective groups of fuel injectors of said engine such that final injection pulse signal to be fed to a particular group of fuel injectors are generated with a timing of said pulse from said cylinder-determining sensor;

for determining whether all said basic injection pulse, said pulse from rotational angle sensor and said pulse signal from said cylinder-determining sensor coincide with each other or not; and

for producing a control signal when the conincidence is not detected; and

(g) means for causing said flip-flop to produce said output signal which is shifted with respect to said output signal produced before receiving said control signal so that charging and discharging operation of said charge-discharge circuit is shifted accordingly.

4,706,197

DEVICE FOR CORRECTING FUNCTIONAL, QUANTITIES IN AN INTERNAL COMBUSTION ENGINE

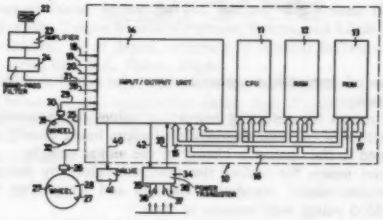
Angelo Ciccarone, Milan, Italy, assignor to Alfa Romeo Auto S.p.A., Napoli, Italy

Filed Jan. 7, 1985, Ser. No. 689,281

Claims priority, application Italy, Jan. 20, 1984, 19263 A/84

Int. Cl.[4] F02P *5/14;* **G06F** *15/20*

U.S. Cl. 364—431.08 **2 Claims**



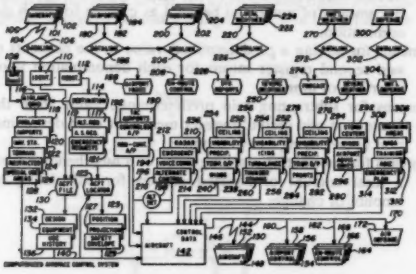
1. A device for correcting functional quantitites of a controlled-ignition internal combustion engine, said device comprising transducers for signals of prechosen engine parameters, at least one engine vibratory signal transducer for sensing detonation, band-pass filter means for filtering said vibratory signal, a microprocessor being provided with a processing stage for calculating said functional quantities produced as a function of said prechosen engine parameters, with a processing stage for withdrawing said vibratory signal within a predetermined angular range of each engine cycle and for calculating a reference signal constituted by the mean value of the amplitude of said vibratory signal for a predetermined number of engine cycles, with memory locations containing predetermined detonation sensitivity factors produced as a function of one of said prechosen engine parameters, and with a processing stage for comparing said referene signal with the amplitude of a pulse of the vibratory signal emitted within a cycle subsequent to those of predetermined number and for correcting the calculated functional quantities when the result of said comparison is greater than a prechosen sensitivity factor, and actuator means, operationally connected to said microprocessor, for causing the variation in said functional quantities to take place in accordance with the calculated and corrected values, the device being characterized in that said microprocessor also comprises further memory locations containing predetermined constants for correcting said sensitivity factors in accordance with said reference signal, and a processing stage for identifying the corresponding correcting constant in said further memory locations and for manipulating by means of said correcting constant the sensitivity factor used in said comparison.

4,706,198

COMPUTERIZED AIRSPACE CONTROL SYSTEM

Daniel M. Thurman, P.O. Box 457, Crested Butte, Colo. 81224

Filed Mar. 4, 1985, Ser. No. 707,859
Int. Cl.[4] G06F *15/48*
U.S. Cl. 364—439 **8 Claims**



5. An aircraft guidance method which comprises:

(a) storing data uniquely identifying and characterizing each aircraft which may fly through an airspace region;

(b) storing, on a real time basis, data representing flight conditions existing in said airspace region;

(c) transferring said flight condition and aircraft data between said aircraft and a regional control unit; and

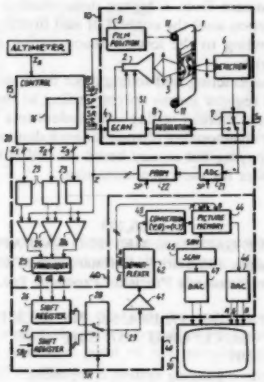
(d) guiding transit of said aircraft through said airspace region in response to said flight conditions along airways which are defined by a plurality of grids angularly disposed at a fixed angle and available at a plurality of vertically spaced flight levels.

4,706,199

MOVING MAP DISPLAY PROVIDING VARIOUS SHADED REGIONS PER ALTITUDE FOR AIRCRAFT NAVIGATION

Stanislas P. Guerin, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 27, 1984, Ser. No. 654,883
Claims priority, application France, Sep. 30, 1983, 83 15656
Int. Cl.[4] G09B *29/12*; G06G *7/78*; G01C *15/00*
U.S. Cl. 364—460 **17 Claims**



1. A moving map display for use in an aircraft based on data recorded on a photographic film having a series of pictures, said data corresponding to altitude surveys coded in accordance with a plurality of predetermined shades and colors in order to cover a total altitude range with a desired precision, said display comprising:

a point-by-point analysis device of the film supplying video signals;

control means for receiving and processing different synchronization and control signals and receiving from an auxiliary altimeter, altitude information of the aircraft and for producing a plurality of n fixed altitude values, each of said n altitude values being smaller than said altitude of the aircraft and which subdivide the said altitude of the aircraft into n+1 regions, each having a predetermined height;

a processing circuit for decoding said video signals in real time by identifying the shade or color of each point on said map and determining from a table of values in memory based on said identified shade or color the altitude of said point corresponding thereto, a plurality of n comparators for comparing the altitude of said point with each of said n altitude values and determining in which region said point is located, a transcoder receiving the output of said comparators for producing color information used for display purposes corresponding to each of these regions; and

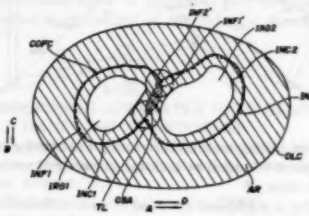
means for cathode displaying said color information.

4,706,200

AREA CUTTING METHOD

Hajimu Kishi; Masaki Seki, and Takashi Takegahara, all of Tokyo, Japan, assignors to Fanuc Ltd., Minamitsura, Japan

PCT No. PCT/JP84/00592, § 371 Date Aug. 13, 1985, § 102(e) Date Aug. 13, 1985, PCT Pub. No. WO85/02572, PCT Pub. Date Jun. 20, 1985
PCT Filed Dec. 14, 1984, Ser. No. 768,118
Claims priority, application Japan, Dec. 14, 1983, 58-235461
Int. Cl.[4] G06F *15/46*; G05B *19/18*
U.S. Cl. 364—474 **1 Claim**



1. An area cutting determining method for determining an area for cutting delimited by a curve of an external shape and at least two closed curves which lie within said curve of the external shape, comprising the steps of:

producing offset curves outwardly from respective ones of said closed curves by an amount dependent upon tool diameter;

checking whether the offset curves intersect one another;

ascertaining that an overlap portion incapable of being area-cut exists when the offset curves intersect one another;

entering area cutting data necessary for performing area cutting based on unidirectional cutting or back-and-forth cutting including a cutting path shift direction and a shift amount;

producing a straight line, which specifies an i-th cutting path PTi, from the cutting path shift direction and the shift amount contained in said area cutting data;

obtaining points Pi, Qi at which said straight line intersects an offset curve obtained by inwardly offsetting the curve of the external shape, and point Ri, Si; Ti, Ui at which said straight line intersects each of said offset curves, respectively; and

cutting an area from which said overlap position incapable of being area cut is omitted by:

moving the tool in a cutting-feed mode along the i-th cutting path from the machining starting point Pi to the intersection point Ri;

moving the tool in the cutting-feed mode along an offset curve containing said intersection point Ri;

moving the tool in the cutting-feed mode along the i-th cutting path after arrival thereat when the tool arrives at the i-th cutting path before arriving at a different offset curve;

moving the tool along the other offset curve after arrival thereat when the tool arrives at a different

moving the tool along the i-th cutting path to the machining end point Qi.

4,706,201

AREA CUTTING METHOD

Hajimu Kish; Masaki Seki; Takashi Takegahara, and Yasushi Onishi, all of Tokyo, Japan, assignors to Fanuc Ltd., Minamitsura, Japan

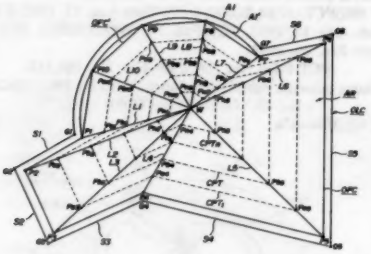
PCT No. PCT/JP85/00008, § 371 Date Sep. 9, 1985, § 102(e) Date Sep. 9, 1985, PCT Pub. No. WO85/03023, PCT Pub. Date Jul. 18, 1985

PCT Filed Jan. 10, 1985, Ser. No. 776,205

Claims priority, application Japan, Jan. 10, 1984, 59-2520

Int. Cl.[4] B23C *3/00;* **B23H** *7/20;* **B23Q** *15/013*

U.S. Cl. 364—474 **10 Claims**



1. An area cutting method for cutting the interior of an area of a workpiece bounded by a closed curve, said method comprising the steps of:

calculating a workpiece centroid of an area bounded by said closed curve;

determining whether each line segment connecting said workpiece centroid with each vertex of the area crosses the closed curve;

partitioning each line segment into a predetermined number of partitions if each line segment does not cross the closed curve; and

performing cutting of the workpiece by moving a tool along plural closed paths each of which is obtained by connecting corresponding ones of partitioning points of respective ones of said line segments.

4,706,202

CONTROL SYSTEM OF A VENDING MACHINE

Osamu Kobayashi; Masaki Akagawa; Masanori Tanaka, all of Sakado; Jun Ishii, and Ryoji Yamagishi, both of Kawagoe, all of Japan, assignors to Nippon Coinco Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1985, Ser. No. 773,309

Claims priority, application Japan, Sep. 7, 1984, 59-187422

Int. Cl.[4] G06F *15/20, 11/16*

U.S. Cl. 364—479 **6 Claims**

1. A control system of a vending machine comrising:

a plurality of switch means provided for respective denominations of money and operated when inserted monies pass through said switch means;

first register means for storing a value corresponding to inserted amount for each denomination;

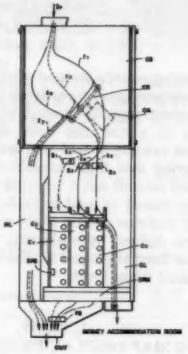
means for adding a value corresponding to the number of operations for each of said switch means to the contents of said first register means for each denomination;

a second register means for storing a value corresponding the amount of money to be used as change for each denomination;

means for adding a predetermined value to the contents of said second register means for each denomination upon insertion of monies;

means for subtracting said predetermined value from the content of said second register means for each denomination upon paying out of monies;

means for subtracting a selling price of a merchandize from a total amount of inserted monies for calculating an amount of change;



means for sequentially subtracting each denomination value starting from the highest denomination within the content of said second register from said calculated amount of change thereby judging whether selling is possible or not and generating a selling enabling signal when selling is possible;

means for sequentially changing the content of said first register means from a higher denomination to a lower denomination until the content of said first register means corresponding to the lowest denomination exceeds said selling price;

means for subtracting said selling price from said content of said first register means corresponding to the lowest denomination, thereby setting said content to a value corresponding an amount of change for each denomination; and

means for paying out money based on said content of said first register for each denominations.

4,706,203

CAPACITIVE GAUGING METHOD AND APPARATUS

Kurt A. Ramsdale, and Keith E. Coffman, both of Shelburne, Vt., assignors to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Dec. 17, 1984, Ser. No. 682,331

Int. Cl.[4] G06G *7/57;* **G01F** *23/00*

U.S. Cl. 364—509 **16 Claims**

1. A capacitive gauging system comprising:

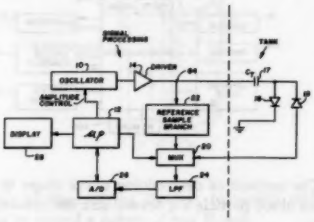
a single capacitance/diode tank-level probe;

a reference circuit;

controlled oscillator means for selectively and successively providing output signals of the low voltage having either of at least two predetermined characteristics in response

to applied control signals, said output signals adapted to be applied to said capacitance/diode tank-level probe to be gauged and to said reference circuit;

control means connected to said oscillator means, to said reference circuit, and to said probe for controlling their operation so as to make available a sequence of at least four response signals comprising (a) a first reference signal from the reference circuit, (b) a second reference signal from the reference circut, (c) a first sensing signal from the probe, and (d) a second sensing signal from the probe, the



first and second response signals of low and high amplitudes, respectively, but both less than approximately 10 volts;

detecting means for detecting said four response signals; and

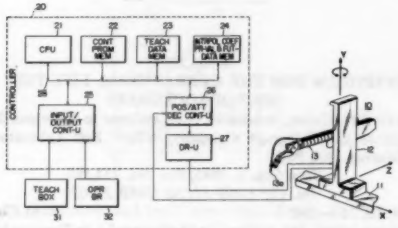
signal processing means for gauging said tank-level probe capacitance by performing signal correction processes utilizing said four detected response signals and including means for determining a correction factor for use in said gauging to eliminate detecting errors due at least to a voltage drop across a diode of said probe, said correction factor being determined from said detected signals.

4,706,204

CONTROLLER FOR MOVABLE ROBOT FOR MOVING A WORK ELEMENT THROUGH A CONTINUOUS PATH

Shinichi Hattori, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 5, 1985, Ser. No. 708,489
Int. Cl.[4] G06F *15/46;* G05B *19/42*
U.S. Cl. 364—513 **14 Claims**



1. A control system for simultaneous, coordinated displacement of all degrees of freedom of the elements of a movable robot having

a base,

a member movable on the base along a first axis of a three orthogonally related axis first coordinate reference frame in which a reference point of the movable member is designated as an origin,

an articulated arm carried by the movable member for movement along a second axis of the first coordinate reference frame and having an intersection with the movable member which is designated as an origin of a three orthogonally related axis second coordinate reference frame, said movable member and arm having articulations representing, by their articulation angles, linear positions of the movable member and arm within the two coordinte reference frames, and

a work element carried by the arm for the performance of a task on a workpiece,

said control system comprising:

a drive unit connected to operate the movable member and arm which receives a command signal for causing simultaneous coordinated required linear and articulation displacements of the movable member and articulation displacement of the arm to produce desired attitudinal positioning of the work element,

control means connected to said drive unit including

means for receiving and means for storing representations of a plurality of discrete teaching points and attitudes of the work element, which teaching points, when connected, define a desired continuous path of travel of the work element,

means for performing displacement calculations using the stored discrete teaching point representations in orthogonal coordinates, converted using the two coordinate reference frames to equivalent articulation coordinates, for determining the simultaneous coordinated required linear and articulation displacements of the movable member and arm in all degrees of freedom to satisfy a chosen path continuously connecting the discrete teaching points, said displacement calculation means producing output representations based on the displacement calculations for moving the work element, with the desired attitude, through the chosen continuous path, and

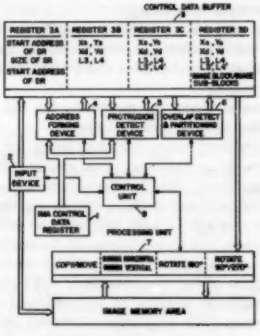
position/attitude control means for receiving the output representations of the required displacements produced by said displacement calculation means as input, for calculating required accelerations in all degrees of freedom in the motions of the movable member and arm called for to achieve the required displacements, and for providing an output command signal to said drive unit for producing the required accelerations of the movable member and arm.

4,706,205

IMAGE PROCESSING APPARATUS WITH REDUCED HANDLING AND STORAGE

Takayuki Akai, Sagamihara, and Junichi Yamaguchi, Ichikawa, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 22, 1985, Ser. No. 725,886
Claims priority, application Japan, Jun. 25, 1984, 59-129430
Int. Cl.[4] G06F *15/62, 12/06*
U.S. Cl. 364—518 **4 Claims**



1. A method of processing digital image information to

create various translation and rotation effects in images represented by said information comprising:

establishing equal-sized and possibly overlapping source and destination areas in a processing system memory and storing the image information to be processed in said source area; and

using only said source and destination areas of said memory and the logical capabilities of said processing system, selectively processing said information stored in said source area to selectively create said effects and directly storing information resulting from said processing in said destination area.

4,706,206

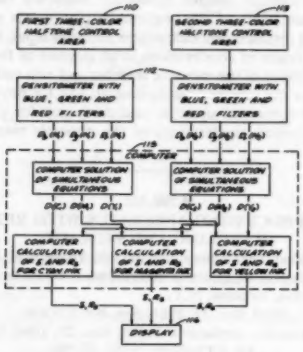
COLOR PRINTING CONTROL USING HALFTONE CONTROL AREAS

Albert J. Benoit, Sandy Hook, Conn.; Dudley M. Boden, Cornwall-on-Hudson, N.Y.; David G. Decker, New Paltz, N.Y.; Stanley J. Kishner, Pomona, N.Y., and Robert D. Van Arsdell, Wappinger Falls, N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 533,925, Sep. 20, 1983, abandoned. This application Aug. 24, 1984, Ser. No. 643,243

Int. Cl.[4] G01J *3/46*

U.S. Cl. 364—526 **18 Claims**


FIRST THREE-COLOR HALFTONE CONTROL AREA
SECOND THREE-COLOR HALFTONE CONTROL AREA
DENSITOMETER WITH BLUE, GREEN AND RED FILTERS
DENSITOMETER WITH BLUE, GREEN AND RED FILTERS
COMPUTER
COMPUTER SOLUTION OF SIMULTANEOUS EQUATIONS
COMPUTER SOLUTION OF SIMULTANEOUS EQUATIONS
COMPUTER CALCULATION OF S AND D_0 FOR CYAN INK
COMPUTER CALCULATION OF S AND D_0 FOR MAGENTA INK
COMPUTER CALCULATION OF S AND D_0 FOR YELLOW INK
DISPLAY

18. A system for monitoring image quality in a multi-color printing process comprising:

printing means for printing two different first and second three-color halftone control areas, the control areas each consisting of overprinted cyan, magenta and yellow halftone images;

densitometer means for measuring the red, green and blue densities of both control areas;

first calculating means for calculating the densities of the halftone images of cyan, magenta and yellow ink from the red, green and blue densities of the first control area;

second calculating means for calculating the densities of the halftone images of cyan, magenta and yellow ink from the red, green and blue densities of the second control area;

third calculating means for calculating the solid densities and dot gains of the cyan, magenta and yellow images from the halftone densities of the first and second halftone images of cyan, magenta and yellow; and

means for displaying the solid densities and dot gains of the cyan, magenta and yellow images.

4,706,207

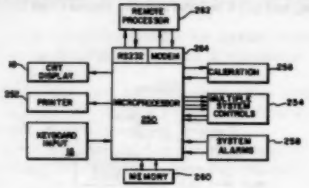
COUNT ACCURACY CONTROL MEANS FOR A BLOOD ANALYSES SYSTEM

James W. Hennessy, Trumbull; Henry R. Angel, Fairfield, and Richard A. Carlson, Meriden, all of Conn., assignors to Nova Celltrak, Inc., Trumbull, Conn.

Filed Jun. 24, 1985, Ser. No. 748,003

Int. Cl.[4] G01N *15/12, 33/48;* **G06M** *11/04*

U.S. Cl. 364—555 **14 Claims**



1. The method of determining curve shape in a particular selected blood particle log normal size distribution curve comprising:

analyzing a blood sample using a cell counter to count blood particles within each adjacent channel of blood particle size over at least a predetermined range of particle size,

calculating the logarithms of the count of blood particles and the particle size for each particle size channel, enabling plotting of a log count vs. log of blood particle size curve of generally symmetrical bell shape,

calculating change of logarithm (Δlog) of counts in adjacent channels,

generating a straight line fixed slope plot representing the change of logarithm of counts vs. the log of blood particle size, giving more weight to those points near the peak of the log count vs. log of blood particle size curve in determining said fixed slope line, and

reversing the calculation step using the points on the straight line plot and calculating the counts in each channel from Δlog and taking the anti-log of log particle size to regenerate ultimately a new curve showing a redistribution of number of the selected blood particles against particle size.

4,706,208

TECHNIQUE FOR THE OPERATIONAL LIFE TEST OF MICROPROCESSORS

Howard D. Helms, Brookside, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 3, 1985, Ser. No. 772,157

Int. Cl.[4] G06F *11/30;* **G05B** *23/02*

U.S. Cl. 364—580 **11 Claims**

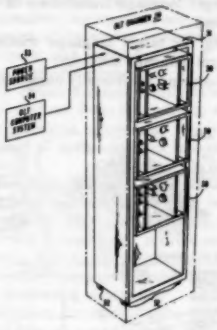
7. Apparatus for performing Operational Life Tests or burn-in of microprocessors, the apparatus comprising:

a plurality of Evaluation Boards, each Evaluation Board comprising an associated microprocessor to be tested and means for storing a diagnostics program for separately exercising the associated microprocessor and transmitting periodic status signals;

means for mounting the plurality of Evaluation Boards in a predetermined spaced-apart relationship to each another; and

control means connected to the plurality of Evaluation Boards for both (a) generating control signals to cause the plurality of Evaluation Boards to concurrently run their stored diagnostics programs and exercise the associated

microprocessors, and (b) reading the status signals generated by each of the Evaluation Boards at predetermined



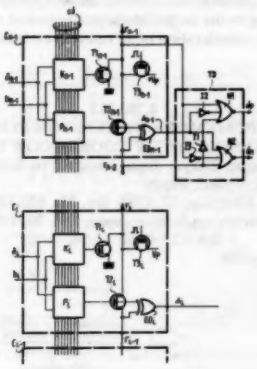
periods of time during the test to permit said control means to record a failure of any Board.

4,706,209

ARITHMETIC AND LOGIC UNIT WITH OVERFLOW INDICATOR

André Picco, Le Peage de Vizille, France, assignor to Societe pour l'Etude et la Fabrication de Circuit Integres Speciaux-E.F.C.I.S., Grenoble, France

Filed Jan. 31, 1985, Ser. No. 696,910
Claims priority, application France, Feb. 3, 1984, 84 01694
Int. Cl.[4] G06F 7/50
U.S. Cl. 364—745 4 Claims



1. Arithmetic and logic unit comprising:

a plurality of switching cells each cell being capable of performing addition and having the rank i, where i=1, 2, . . . (i+1) . . . (n−1), in which the rank (n−1) is the highest;

a control bus with each cell being connected to said control bus so as to be simultaneously controlled in order to define a determined arithmetic or logic operating mode of the unit, in which:

a cell of rank i has an input to receive a bit of rank i of a first number A, an input to receive a bit of the same rank i of a second number B, and has an output for a carry and for a result;

a cell of rank i+1 having its carry input connected to the carry output of the cell having the rank i;

a cell of highest rank receiving on its cell inouts a sign bit of the first number B and a sign bit of the second number B;

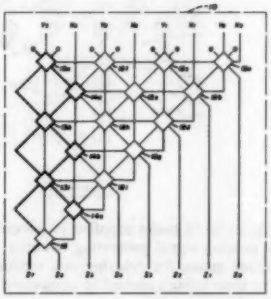
and an overflow test circuit for supplying a positive overflow signal and a negative overflow signal, wherein the overflow test circuit comprises three inputs respectively connected to the carry output of the highest ranking cell and to the carry and result outputs of said highest ranking cell.

4,706,210

GUILD ARRAY MULTIPLIER FOR BINARY NUMBERS IN TWO'S COMPLEMENT NOTATION

William E. Snelling, Columbia, and John E. Penn, Sykesville, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Dec. 13, 1984, Ser. No. 681,158
Int. Cl.[4] G06F 7/52
U.S. Cl. 364—758 15 Claims



1. A digital multiplier for multiplying digital numbers represented in two's complement notation comprising:

a plurality of positively and negatively signed cells connected in a guild array, wherein said plurality of positively and negatively signed cells includes a most significant signed cell and a least significant signed cell, and wherein each signed cell except said least significant signed cell receives input signals from adjacent signed cells,

each of said cell comprising;

a plurality of inverter circuits which output signals and complements thereof,

multiplying means with two inputs connected to receive respective bits of two corresponding numbers to be multiplied, the product of the two respective bits representing a microproduct term and

a summing circuit connected to said multiplying means to receive the microproduct term as an input and connected to said plurality of inverters such that the summing circuit passes the microproduct as an output to an adjacent signed cell in accordance with the inverter circuit signals and complements thereof.

4,706,211

DIGITAL MULTIPLYING CIRCUIT

Takao Yamazaki, and Seiichiro Iwase, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,155
Claims priority, application Japan, Sep. 22, 1983, 58-175881
Int. Cl.[4] G06F 7/52
U.S. Cl. 364—760 7 Claims

1. A digital multiplying circuit for multiplying first and second digital signals comrpising:

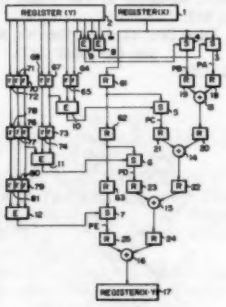
a plurality of partial product signal generating circuits for generating respective outputs, each of said circuits being supplied with said first digital signal;

a plurality of control signal generators for generating con-

trol signals which are supplied to corresponding ones of said partial product signal generating circuits, each of said generators being supplied with selected bits of said second digital signal as a respective first input signal;

adding means receiving the outputs of said partial product signal generating circuits for adding the same to generate a product of said first and second digital signals, said adding means having a plurality of adders for adding two second input signals, each of said second input signals for a respective adder being either one of said outputs of said partial product signal generating circuits or an output of another of said adders;

first delay means for selectively delaying said first digital



signal prior to its being supplied to selected ones of said partial product signal generating circuits;

second delay means for delaying said second input signals prior to their being supplied to respective adders of said adding means; and

third delay means for delaying the first input signals supplied to selected ones of said control signal generators so that the delay imparted by said first delay means to the first digital signal thereafter supplied to a respective partial product signal generating circuit is equal to the delay imparted by said third delay means to the first input signal supplied to the corresponding control signal generator whose output is supplied to said respective partial product signal generating circuit.

4,706,212

METHOD USING A PROGRAMMED DIGITAL COMPUTER SYSTEM FOR TRANSLATION BETWEEN NATURAL LANGUAGES

Peter P. Toma, 5467 Bahia La., La Jolla, Calif. 92037

Filed Mar. 31, 1971, Ser. No. 176,672
Int. Cl.[4] G06T *15/38*
U.S. Cl. 364—900 **24 Claims**

MICROFICHE APPENDIX INCLUDED
(21 Microfiche, 1235 Pages)

1. A method for translation between source and target natural languages using a programmable digital computer system, the steps comprising:

(a) storing in a main memory of the computer system a source text to be translated;

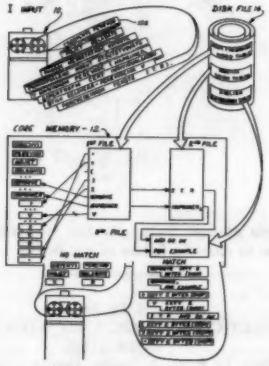
(b) scanning and comparing such stored source words with dictionaries of source language words stored in a memory and for each source text word for which a match is found, storing in a file in main memory each word and in association with each such word, coded information derived from such dictionary for use in translation of such word, the coded information including memory offset address linkages to a memory in the computer system where grammar and target language translations for the word are stored;

(c) analyzing the source text words in its file of words, a complete sentence at a time, and converting the same into a sentence in the target language utilizing the coded information and including the steps of

(1) utilizing the memory offset address linkages for obtaining the target language translations of words from a memory; and

(2) reordering the target language translation into the proper target language sequence;

the step of analyzing additionally comprising the steps of



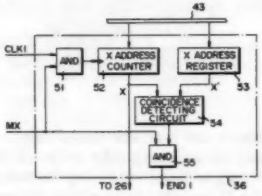
analyzing each source word in multiple passes through each sentence of the source text assigning codes thereto, considering all the codes which previous passes have attached to a word and assigning target language synthesis codes attached to the meaning with which the code functions in the sentence, placing the word into a form corresponding to the target language dependent upon the analysis and consideration of all relevant codes assigned to the words.

4,706,213

GRAPHIC MEMORY SYSTEM FOR INTERAREA TRANSFER OF X-Y COORDINATE DATA

Yoshiaki Bandai, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 27, 1984, Ser. No. 655,158
Claims priority, application Japan, Sep. 30, 1983, 58-182638
Int. Cl.[4] G06F *13/06, 7/00*
U.S. Cl. 364—900 **8 Claims**



1. A graphic memory interarea data transfer system for a graphic display apparatus which has a graphic-memory for storing graphic data and which transfers graphic data at a source area in said graphic memory, designated by an apparatus of higher performance, to a destination area therein and displays the graphic data, comprising:

X coordinate address generating means responsive to an X start coordinate address, supplied from the apparatus of higher performance, for continuously generating X coordinate addresses of the source or destination area of said

graphic memory and supplying the X coordinate addresses to said graphic memory;

Y coordinate address generating means responsive to a Y start coordinate address, supplied from the apparatus of higher performance, for continuously generating Y coordinate addresses of the source or destination area of said graphic memory and supplying the Y coordinate addresses to said graphic memory;

buffer memory means for temporarily storing continuous graphic data read out from said graphic memory;

buffer memory address generating means for supplying continuous read or write addresses to said buffer memory means;

first control means for reading out a plurality of coordinate graphic data from said graphic memory in a read cycle in accordance with the addresses of the source area supplied from said X and Y coordinate address generating means and for writing the readout graphic data in an address of said buffer memory means designated by said buffer memory address generating means; and

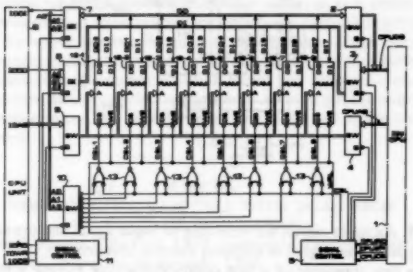
second control means for reading out a plurality of coordinate graphic data in a write cycle following said read cycle from the address of said buffer memory means designated by said buffer memory address generating means and for writing the readout graphic data at the addresses of the destination area of said graphic memory supplied from said X and Y coordinate address generating means, wherein the same structures of said X and Y coordinate address generating means are employed to generate addresses for both said source area and said destination area.

4,706,214

INTERFACE CIRCUIT FOR PROGRAMMED CONTROLLER

Yoshio Kassai, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 21, 1984, Ser. No. 623,154
Claims priority, application Japan, Jun. 22, 1983, 58-112067
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—900 **3 Claims**



1. An interface circuit disposed between a central processing unit (CPU) of a programmed controller and an input/output unit (IOU) having a data link unit other than said CPU, said circuit comprising

a plurality of N×1-bit random access memory units (RAMs) each having address inputs, data input and output means, and a chip-select input, wherein N is greater than 1;

RAM data bus means having respective lines connected to the data input and output means of the corresponding RAMs;

a RAM address bus connected to the address inputs of the RAMs;

IOU accessing means operated by the IOU and including first switch means for connecting the RAM address bus to an IOU address bus, second switch means for connecting the RAM data bus to an IOU data bus, and means for connecting a chip select output of the IOU simultaneously to the chip-select inputs of the RAMs to thereby read and write a plurality of bits in parallel from and to the RAMs; and

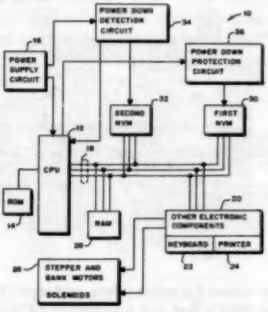
CPU accessing means operated by the CPU and including third switch means for connecting the RAM address bus to a CPU address bus of the CPU, selective switch means for selectively connecting individual lines of the RAM data bus means from each corresponding RAM to data input and output means of the CPU, and CPU chip select means operated in correspondence with said selective switch means for selectively connecting a chip select output of the CPU to each respective chip select input of the RAMs to thereby read and write a plurality of bits individually from and to the RAMs.

4,706,215

DATA PROTECTION SYSTEM FOR ELECTRONIC POSTAGE METERS HAVING MULTIPLE NON-VOLATILE MULTIPLE MEMORIES

Wallace Kirschner, Trumbull, Conn.; Easwaran C. N. Nambudiri, East Meadow, N.Y., and Douglas H. Patterson, Norwalk, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Aug. 22, 1984, Ser. No. 643,111
Int. Cl.[4] G06F *7/12*
U.S. Cl. 364—900 **14 Claims**



4. A system for protecting the accounting data stored in an electronic postage meter having multiple non-volatile memories for the storage of accounting data, comprising:

a first non-volatile memory for storing transaction accounting data therein;

microprocessor means for writing postage transaction accounting data into said first non-volatile memory in real time during each trip cycle of the meter;

a second non-volatile memory for storing accounting data therein;

said microprocessor means writing said transaction accounting data into said second non-volatile memory only during the power down cycle of the meter; and

power down protection circuit means for disabling said first non-volatile memory when the meter enters a power down cycle to prevent any further writing of data into said first non-volatile memory.

4,706,216

CONFIGURABLE LOGIC ELEMENT

William S. Carter, Santa Clara, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Filed Feb. 27, 1985, Ser. No. 706,429
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—94 **21 Claims**

1. A configurable logic element comprising:

means for receiving a first plurality of N binary input signals;

means for receiving a second plurality of M binary feedback signals;

means for selecting K of said M+N binary signals (where $K \leq N+M$);

combinational logic means for receiving said K binary signals from said means for selecting, said combinational

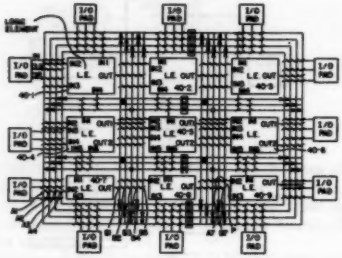
logic means having a plurality of configurations including at least

a first configuration in which said combinational logic means generates a first set of binary output signals, each of which represents a function of some of said K binary signals and

a second configuration in which said configurable combinational logic means generates a second set of binary output signals, each of which represents a function of some of said K binary signals, wherein the set of functions represented by said first set of binary signals is not the same as the set of functions represented by said second set of binary signals;

a configurable storage circuit comprising:

a plurality of input leads for receiving a plurality of input signals, said input signals corresponding to said input leads on a one-to-one basis, said input signals comprising selected ones of said binary output signals of said combinational logic means and selected ones of said N binary input signals,



memory means for storing data, said memory means having at least a first and a second input lead and at least one output lead;

first means having a first configuration in which said first means provides a first selected one of said input signals of said configurable storage circuit to said first input lead of said memory means

second means having a first and a second configuration in which said second means provides a second and a third selected one, respectively of said input signals of said configurable storage circuit to said second input lead of said memory means,

said memory means generating said second plurality of M binary signals in response to said signals provided by said first and said second means; and

a configurable select logic comprising:

means for receiving said output signals generated by said combinational logic means and said M binary signals generated by said configurable storage circuit, and

means for selecting output signals from among the signals received by said select logic.

4,706,217

SEQUENTIAL LOGIC CIRCUIT

Hiroshi Shimizu, Kawasaki, and Masao Kaizuka, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

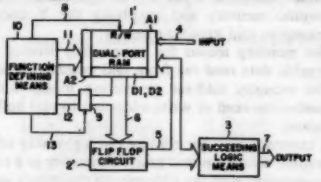
Filed Mar. 25, 1986, Ser. No. 843,748

Claims priority, application Japan, Mar. 28, 1985, 60-64900

Int. Cl.[4] G11C *11/40*

U.S. Cl. 365—154 **6 Claims**

1. A sequential logic circuit, comprising a logic memory means which stores a predetermined logic state; a preceding logic means which is supplied with an external input and a logic state stored in said logic memory means as inputs, for generating a new logic state by executing a logic calculation upon these inputs, and for rewriting the content of said logic memory means with said new logic state; a succeeding logic means which is supplied with said logic state stored in said logic memory means as an input for outputting a logic state



obtained from a logic calculation with the input; and a function defining means which defines a logic calculation executed in said preceding logic means and/or said succeeding logic means depending on the desired function.

4,706,218

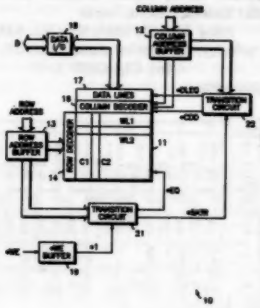
MEMORY INPUT BUFFER WITH HYSTERESIS

Lal C. Sodd, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 28, 1986, Ser. No. 823,447

Int. Cl.[4] G11C *13/00, 11/40*

U.S. Cl. 365—189 **16 Claims**



1. An input circuit for receiving an input signal and providing an output signal in response thereto, comprising:

a first transistor of a first conductivity type having a first current electrode coupled to a first power supply terminal, a second current electrode coupled to a switch point control node, and a control electrode for receiving the input signal;

a second transistor of a second conductivity type having a first current electrode coupled to a second power supply terminal, a second current electrode coupled to the switch point control node, and a control electrode for receiving the input signal;

an inverter having an input coupled to the switch point control node, and an output;

load means and a third transistor of the first conductivity type coupled in series between the first power supply terminal and the switch point control node, the third transistor having a control electrode coupled to the output of the inverter and the load means for limiting current through the third transistor; and

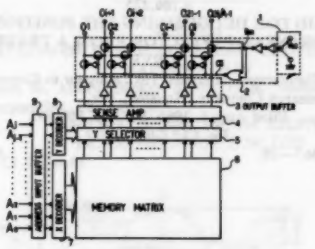
output means, coupled to the inverter, for providing the output signal.

4,706,219

WORD LENGTH SELECTABLE MEMORY

Shinobu Miyata, and Takashige Kinouchi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 10, 1986, Ser. No. 850,302
Claims priority, application Japan, Apr. 10, 1985, 60-75734
Int. Cl.[4] G11C 7/00
U.S. Cl. 365—189 **19 Claims**



1. An integrated circuit memory comprising a memory cell matrix having a plurality of groups of output lines each group including at least two output lines; a plurality of groups of external terminals each group including at least two external terminals; output selection means connected between the output lines and the external terminals and adapted to connect the output lines to the corresponding external terminals in a first mode and to alternatively connect output lines of each output line group to one predetermined external terminal of the corresponding external terminal group in a second mode; control means connected to at least one given external terminal which is disconnected from the corresponding output line when the output selecting means is in the second mode, the control means being in response to a signal from the given external terminal to control the output selection means so as to cause it to selectively connect one output line of each output line group to the above predetermined external terminal of the corresponding external terminal group; and mode selection means associated to the output selection means and having a circuit structure fixed by a selected code mask so as to put the output selection means in a predetermined one of the first and second modes.

4,706,220

NON-VOLATILE RAM CELL WITH DUAL HIGH VOLTAGE PRECHARGE

John R. Spence, Villa Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 14, 1986, Ser. No. 829,253
Int. Cl.[4] G11C 11/40, 9/00
U.S. Cl. 365—203 **9 Claims**

1. A memory cell circuit for storing and recalling the first or second state of a digital signal on a data bus in response to being addressed by an address signal on an address bus;

said memory cell circuit having a store cycle, each store cycle having a repeating series of recurring store cycle sequences;

each store cycle sequence being controlled by an HIV (High Voltage) Signal during a first interval, and a STORE SIGNAL during a second timing interval from a timing signal source;

said memory cell circuit also having a recall cycle, each recall cycle being controlled by a MEMORY RESET SIGNAL (VCC2) from a memory reset signal source, to preset the state of the aemory cell circuit during a first interval, a RECALL TRANSFER SIGNAL from a recall transfer signal source, and a RECALL OUTPUT CONTROL SIGNAL from a recall output control signal source in a second and third reset signal interval to control the recall timing sequence, the memory cell comprising:

a VOLATILE RAM CELL having:

a flip-flop having first and second nodes at which complementary output signals are provided; said output signals having a first or second stable state corresponding to the state of the data bus in response to an address signal on the data bus;

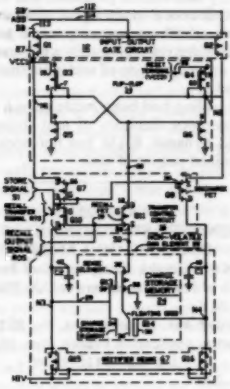
said flip-flop also having a SET TERMINAL responsible to a set signal for forcing the flip-flop to assume a predetermined state coupled to said first node and a RESET TERMINAL responsive to said RESET SIGNAL for forcing the flip-flop to assume a predetermined state;

a NON-VOLATILE RAM element having;

a first capacitor coupled between a third node and a reference potential;

a second capacitor coupled between a fourth node and a reference potential;

first and second rectifier means responsive to said HIV signal at the onset of each stored timing signal sequence for simultaneously precharging said first and second capacitors during the first timing interval of each store cycle sequence; and



transfer control circuit means responsive to each STORE SIGNAL for discharging said first capacitor in response to said flip-flop output being in a first state and for discharging said second capacitor in response to said flip-flop being in a second state;

said NON-VOLATILE RAM element also having;

a charge storage memory having a OUTPUT TERMINAL and being responsive to the charge state of said first and second capacitors for storing a state corresponding to the state of said flip-flop into a non-volatile charge storage element;

said charge storage memory being responsive to said RECALL TRANSFER SIGNAL in said recall timing sequence to provide said SET SIGNAL, said SET SIGNAL having a state corresponding to the stored state of said non-volatile storage element;

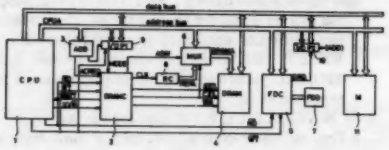
said transfer control circuit means being responsive to said RECALL OUTPUT CONTROL SIGNAL for coupling said SET SIGNAL to said first node to set the state of said flip-flop during said recall timing signal sequence to a state corresponding to the state of said non-volatile storage element.

4,706,221

REFRESHING OF DYNAMIC RAM

Masaharu Satoh, and Sadakatsu Hashimoto, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 30, 1983, Ser. No. 480,374
Claims priority, application Japan, Jan. 31, 1983, 58-15744
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—222 **4 Claims**



1. Means for refreshing a dynamic RAM in a computer system having a central processor, a dynamic RAM accessible by said central processor and having a plurality of memory elements, and at least one input-output port comprising:

burst mode refresh means for refreshing all said memory elements of said dynamic RAM, said dynamic RAM not being accessible by said central processor when refreshing is performed by said burst mode refresh means;

means for determining if said input-output port is being accessed by said central processor and for developing an input/output access mode signal representative thereof;

input/output refresh means, responsive to said means for determining, for refreshing only a portion of said memory elements upon detection of said input/output access mode signal; and

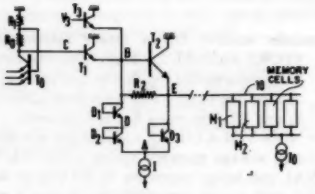
means for enabling said burst mode refresh means to refresh all said memory elements of said dynamic RAM only when said dynamic RAM has not been refreshed for a predetermined period of time.

4,706,222

DARLINGTON TYPE SWITCHING STAGE FOR A LINE DECODER OF A MEMORY

Jean-Claude Kwiatkowski, Caen, and Guy Imbert, Hermanville/Mer, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 15, 1986, Ser. No. 852,052
Claims priority, application France, Apr. 16, 1985, 85 05702
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—230 **12 Claims**



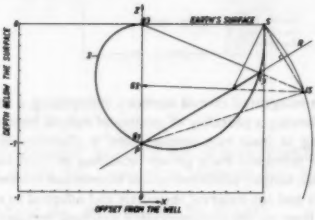
1. A switching stage of the Darlington type comprising a first transistor having a base which is the input of the stage for reception of a logic control signal that varies between a selection level and a non-selection level, means coupling an emitter of the first transistor to a base of a second transistor, whose emitter, which constitutes an output of the stage, supplies a first current when the said logic control signal is at its selection level and a second current of lower intensity than the first current when the said logic control signal is at its non-selection level, first and second diodes connected in series in the forward direction between the base of the second transistor and an auxiliary current source having an intensity between the intensities of the first and second currents, said first and second series connected diodes constituting a first branch, and a third diode connected in the forward direction between the emitter of the second transistor and said auxiliary current source to form a second branch such that during switching of the control signal between its selection level and its non-selection level charges stored in the base of the second transistor are evacuated by the second current which passes for the major part through the first branch.

4,706,223

METHOD FOR DETERMINING THE POSITION OF A SUBTERRANEAN REFLECTOR FROM A TRAVELTIME CURVE

Carol J. Zimmerman, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Aug. 1, 1986, Ser. No. 891,832
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—38 **14 Claims**



1. A method for processing seismic signals received at each of a number of approximately colinear acoustic receiver locations separated from each other along a first axis in a first plane after propagating from a seismic source located in the first plane through a subterranean earth formation, including the steps of:

(a) identifying from the seismic signals a traveltime curve associated with a subterranean plane reflector;

(b) generating a first signal indicative of the dip angle, θ, of the plane reflector using the relationship

$$\theta = \arctan((X_I - S)/Z_I)$$

where (S,0) are the coordinates of the seismic source and (X_I, Z_I) are the coordinates of the image source corresponding to the seismic source, with

$$Z_I = ((t^2_a - t^2_b)v^2 - (g_a{}^2 - g^2_b))/(-2(g_a - g_b)),$$

and

$$X_I = (t^2_a v^2 - (Z_I - g_a)^2)^{\frac{1}{2}},$$

with

t_a = arrival time at a first receiver location of the reflected signal associated with the traveltime curve,

g_a = distance along the first axis of the first receiver location above a second axis, where the second axis lies in the first plane, is perpendicular to the first axis, and intersects the location of the source,

t_b = arrival time at a second receiver location of the reflected signal associated with the traveltime curve,

g_b = distance along the first axis of the second receiver location above the second axis, and

v = velocity of the reflected signal associated with the traveltime curve; and

(c) determining the distance P, along the first axis above the second axis, of the point of intersection of the plane defined by the reflector and the first axis, using the relationship

$P = [(g_d - S\tan\theta)/2] + [(\cos\theta) \cdot (-S^2\cos^2\theta + Sg_d\sin\theta)(4\cos\theta - \sin\theta) + t_d^2v^2 - g_d\sin^2\theta)^{\frac{1}{2}}]$, where

t_d=the arrival time at a receiver location of the reflected signal associated with the traveltime curve, and

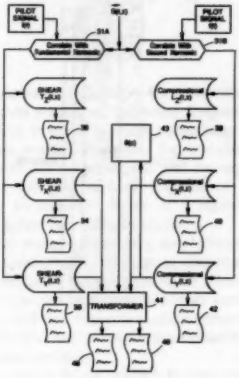
g_d=the distance along the first axis, of the receiver location associated with t_d, above the second axis.

4,706,224

METHOD OF VERTICAL SEISMIC PROFILING AND EXPLORATION

Richard M. Alford, Broken Arrow, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Feb. 21, 1986, Ser. No. 832,570
Int. Cl.[4] G01V *1/00, 1/34, 1/28*
U.S. Cl. 367—41 **22 Claims**



10. A method of vertical seismic profile exploration for extracting the shear and compressional components of the earth's response to seismic energy imparted into the earth with a horizontally directed swept frequency vibrator, comprising the steps of:

(a) periodically imparting seismic energy into the earth's subterranean formations at or near a well borehole with a horizontally directed swept frequency vibrator, wherein the swept frequency vibrator sweeps a band of frequencies according to a pilot sweep signal f(t);

(b) concurrently, traversing a region of interest in the well borehole with a multicomponent sonde having three geophones with orthogonal axes (V_z,H_x,H_y) to develop a plurality of raw response signals $V_z(t,z)$, $H_x(t,z)$, and $H_y(t,z)$ representative of the earth's response to the periodically imparted seismic energy;

(c) cross-correlating the raw response signals $V_z(t,z)$, $H_x(t,z)$, and $H_y(t,z)$ of the three geophones with the pilot sweep signal f(t) to obtain shear component response signals $T_x(t,z)$, $T_x(t,z)$, and $T_y(t,z)$ representative of the shear measures of the earth's response to the imparted seismic energy;

(d) forming a second harmonic of the pilot sweep signal f(t); and

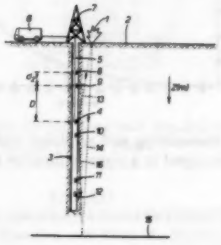
(e) cross-correlating the raw response signals $V_z(t,z)$, $H_x(t,z)$, and $H_y(t,z)$ with the second harmonic of the pilot sweep signal f(t) to obtain compressional component response signals $L_z(t,z)$, $L_x(t,z)$, and $L_y(t,z)$ representative of the compressional measures of the earth's response to the imparted seismic energy.

4,706,225

PROCESS FOR OBTAINING AND PROCESSING SEISMIC DATA MEASURED AT AN EXPLORATORY WELL

Jean-Jacques Raoult, Paris, France, assignor to Compagnie Francaise des Petroles, Paris, France

Filed Dec. 24, 1984, Ser. No. 685,659
Claims priority, application France, Jan. 19, 1984, 84 00779
Int. Cl.[4] G01V *1/00*
U.S. Cl. 367—57 **2 Claims**



1. A process for obtaining seismic data measured at an exploratory well (3), using an installation for an acquisition of seismic data which comprises equipment for measuring seismic data including transmitting means (1) for transmitting seismic waves and receiving means (4) for receiving down-going or up-going seismic waves originating from said transmitting means, said transmitting means and said receiving means being individually disposed at a single position on a surface of the ground adjacent said exploratory well and at a plurality of vertically spaced measurement points (8,9,4,10,11,12) in said exploratory well, and an installation for processing the seismic data provided by said installation for the acquisition of the data, said processing installation separating said down-going waves from said up-going waves and carrying out coherence filtering of said waves, wherein said measurement points are divided into at least two groups vertically spaced apart down the well, wherein each group comprises a plurality of said measurement points equally spaced apart down said well by a distance (dz) which is less than a predetermined limit distance to avoid aliasing ambiguities in a dephasing of said seismic waves received by said receiving means, wherein closest measurement points of adjacent groups are separated by a distance (D) greater than said limit distance, and wherein said processing installation carries out a separation of said down-going waves and said up-going waves belonging to the same group.

4,706,226

SEISMIC LINE AMPLIFIER

Steven W. Houghtaling, Littleton, Colo., assignor to Azygous, Westminster, Colo.

Filed Nov. 8, 1985, Ser. No. 796,658
Int. Cl.[4] G01V *1/00, 1/36*
U.S. Cl. 367—66 **16 Claims**

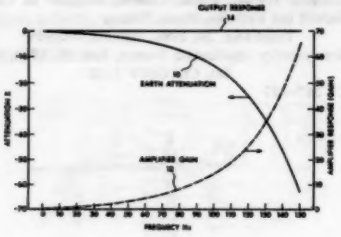
1. A seismic line amplifier for receiving from a geophone a seismic signal representing an earth originated seismic impulse, said seismic amplifier comprising:

first circuit means responsive to a receipt of a seismic signal for producing a first signal representing an essentially flat frequency response of said seismic impulse,

means for conditioning said first signal to produce a second signal,

second circuit means for amplifying said second signal and

for adjusting the frequency at which unity gain of said received seismic signal occurs, and



means for transmitting said amplified and adjusted signal as an output signal to a signal utilization means.

4,706,227

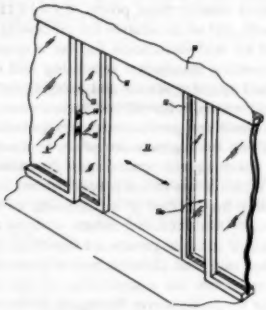
ACOUSTIC OBSTRUCTION DETECTOR AND METHOD

Dale R. DuVall, Keller; John E. Bateson, Carrollton; Lew V. Hewitt, and David P. Hewitt, both of Corpus Christi, all of Tex., assignors to Overhead Door Corporation of Texas, Dallas, Tex.

Filed Jan. 31, 1986, Ser. No. 824,723

Int. Cl.[4] G01S *9/66*

U.S. Cl. 367—96 **9 Claims**



1. A method for automatically controlling the operation of a closure member between an open position and a closed position for respectively opening and closing a passageway defined by first and second spaced boundary members, said method comprising:

(a) transmitting acoustic energy from said first boundary member across said passageway toward second spaced boundary member;

(b) receiving reflected echoes of said transmitted acoustic energy at said first boundary member; and

(c) preventing said closure member from being moved from said open position toward said closed position when the transit time span of said reflected echoes is indicative of the presence of an obstruction within an obstruction detection zone, as well as in the absence of reflected echoes during a predetermined time period, and enabling said closure member to be moved from said open position toward said closed position when the transit time span of said reflected echoes is indicative of the absence of an obstruction within said obstruction detection zone.

4,706,228

ASYMMETRICAL LATERAL-FORCE SEISMIC SOURCE TRANSDUCER

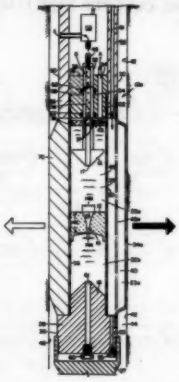
Thomas E. Owen, and Edgar C. Schroeder, both of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Continuation-in-part of Ser. No. 678,290, Dec. 5, 1984, Pat. No. 4,651,311. This application Oct. 3, 1986, Ser. No. 915,146

The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.

Int. Cl.[4] G01V *1/40*

U.S. Cl. 367—147 **10 Claims**



1. A borehole seismic impulse source transducer comprising:

an elastic, electrically insulating sleeve attached to and extending from a downhole end member to an uphole end member, said sleeve, downhole end member, and uphole end member defining a chamber for receiving electrolyte fluid, said sleeve completely surrounding an intermediate portion of said transducer and forming a sidewall of said chamber;

said chamber divided into an upper volume area and a lower volume area by an insulator having an aperture channel therein, whereby said upper and lower volume areas of said chamber are in fluid communication;

first and second electrodes extending into said upper volume area and said lower volume area, respectively, and in spaced relation from one another;

means for supplying voltage across said electrodes whereby an arc discharge may be produced through and in the vicinity of said aperture channel;

means for intermittent venting of a gas build up produced as a result of a number of said arc discharges in said electrolyte fluid, said gas venting means having a means for sensing said gas build up within said chamber; and

at least one reaction mass surrounding approximately one half of said chamber sidewall, said mass being adapted to reflect a pressure wave incident on said mass resulting from said arc discharge so as to produce an intensified pressure pulse within said chamber in a direction away from said mass, said transducer thereby being adapted to produce asymmetrical forces in a geologic medium surrounding said chamber.

4,706,229

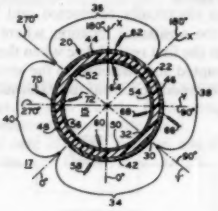
ELECTROACOUSTIC TRANSDUCER

John C. Congdon, Fort Wayne, Ind., assignor to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Continuation of Ser. No. 748,753, Jun. 26, 1985, abandoned, which is a division of Ser. No. 446,330, Dec. 2, 1982, Pat. No. 4,546,459. This application Sep. 12, 1986, Ser. No. 906,450

Int. Cl.[4] H04R *17/00*

U.S. Cl. 367—159 17 Claims



1. An electroacoustic transducer for transmitting or receiving acoustic waves within an operating frequency range in a liquid transmission external medium comprising:

electroacoustic transducer means for transducing between electrical and acoustical signals and having at least first and second vibratile surfaces capable of radiating and responding to acoustic waves in a liquid transmission medium coupled respectively thereto;

said transducer means comprising an electroacoustic transducer ring having opposite ends, an end to end axis, inner and outer surfaces, and adapted to be filled with a liquid transmission internal medium, said inner surface defining a ring cavity; said first vibratile surface comprising said ring outer surface and said second vibratile surface comprising said ring inner surface;

cavity baffle means being placed in said ring cavity for forming a plurality of separate cavity compartments each of which define a respective section of said inner surface;

mounting means for mounting said baffle means in said cavity that does not rigidly affix said baffle means to said ring so that each point of said ring is substantially free to vibrate and to substantially prevent transmission of acoustic vibration between said ring and said baffle means;

each said compartment transversely separating a respective one of said surface sections of said inner surface from the remaining sections of said inner surface so that the resonant frequency within each of said compartments is higher than the resonant frequency within said cavity without said compartments; each of said compartments having axial ends; conducting means for establishing acoustical communication between said internal and external mediums through at least one axial end of at least one of said compartments for obtaining a pressure gradient in said at least one compartment; whereby the acoustic wave pressure gradient to said inner surface of said ring is maintained over a predetermined operating frequency range.

4,706,230

UNDERWATER LOW-FREQUENCY ULTRASONIC WAVE TRANSMITTER

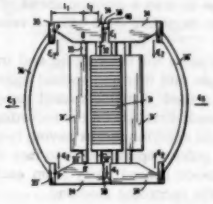
Takeshi Inoue, and Takatoshi Nada, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 29, 1986, Ser. No. 901,693

Int. Cl.[4] H01V *7/00*

U.S. Cl. 367—174 15 Claims

1. An underwater low-frequency ultrasonic wave transmitter, comprising; an active columnar member comprising a piezoelectric ceramic material, a non-active columnar member disposed on either side of said active columnar member, convex shells acting as acoustic radiation surfaces arranged outwardly of said non-active columnar members, and displacement enlarging means for coupling said non-active and active columnar members to said convex shells.



4,706,231

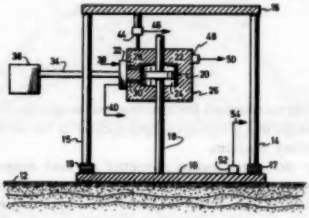
REACTION MASS ACCELERATION FEEDBACK DEVICE

Allan H. Mueller, Houston, and Dean P. Perkins, Pasadena, both of Tex., assignors to Geosource Inc., Houston, Tex.

Filed Jul. 29, 1985, Ser. No. 760,321

Int. Cl.[4] H04R *23/00*

U.S. Cl. 367—190 14 Claims



8. In the operation of a vibratory seismic sound source for imparting a swept frequency vibratory sound signal into the earth wherein an electrohydraulic control system is employed to control the application of hydraulic pressure to a hydraulic piston in response to a swept frequency electrical signal, the hydraulic piston being housed in a reaction mass structure and connected by a shaft to a shaker plate in contact with the earth's surface, the improved method for developing feedback comprising:

(a) developing an electrical signal proportional to the instantaneous acceleration of the reaction mass structure; and

(b) electrically and degeneratively combining the electrical signal of step (a) with the swept frequency electrical signal in a manner so as to produce degenerative feedback to the electrohydraulic control system.

4,706,232

OPTICAL RECORDING AND REPRODUCING APPARATUS

Saburo Funada, Hamura; Yoshiro Yoda, Tama; Shoji Yoshikawa, Hachioji; Masanori Doi, Akishima, and Kazutake Sugawara, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1986, Ser. No. 919,408

Claims priority, application Japan, Oct. 17, 1985, 60-233023

Int. Cl.[4] G11B *5/03, 7/12, 11/14, 13/04*

U.S. Cl. 369—13 7 Claims

1. An optical recording and reproducing apparatus which comprises:

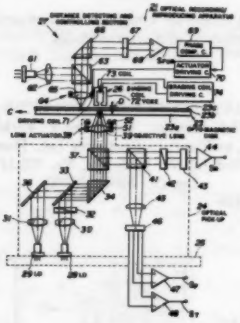
a first light source for generating a recording light beam

converged and irradiated upon an optical recording medium;

a second light source for generating an erasing light beam converged and irradiated upon the optical recording medium so as to scan a position ahead of the position upon which the recording light beam is converged and irradiated;

an optical system for converging and irradiating the light beams from said first and second light source upon two positions a small distance spaced away from each other along a track direction on the recording medium;

magnetic field applying means having two opposite-polarity magnetic poles disposed so as to face the two positions a small distance spaced away from each other along the track on the recording medium;



a movable mechanism for moving said magnetic field applying means in a direction perpendicular to the surface of the recording medium;

distance detecting means mounted on said magnetic field applying means, for detecting a distance between the magnetic poles of said magnetic field applying means and the surface of the recording medium;

distance controlling means for controlling said movable mechanism in response to an output signal of said distance detecting means to maintain the magnetic poles of said magnetic field applying means at a small constant distance away from the surface of the recording medium; and

a tracking servo system for receiving at least one returned light of the two light beams converged and irradiated upon the recording medium by said optical system and allowing the converged and irradiated light beam spots to follow a current track.

4,706,233

CONTROL SYSTEM FOR RECORD CHANGER APPARATUS

Stéphane M. A. d'Alayer de Costemore d'Arc, Genappe, Belgium, assignor to Staar S.A., Belgium

Filed Mar. 31, 1986, Ser. No. 846,092

Claims priority, application Belgium, Apr. 30, 1985, 0/214939

Int. Cl.[4] G11B *17/00, 17/22*

U.S. Cl. 369—33 **9 Claims**

1. A control apparatus for switching the reading operation between a plurality of record discs in an information-reproducing system comprising:

a plurality of record discs carrying information of two different types, one type of information being reproducible in video form and an other type being reproducible in audio form;

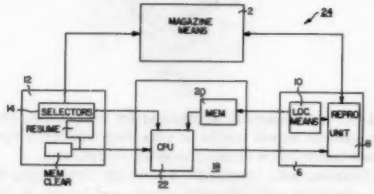
magazine means receiving said record discs including a first record disc carrying information of the one type and a second record disc carrying information of the other type;

reading means including a reproduction unit for conducting a reading operation for reading information on a record disc from said magazine means;

control means operable from an external source to interrupt the reading operation on a first record disc and to switch the reading operation to a second record disc, and to terminate the reading operation on the second record disc and to resume the reading operation on the first record disc;

locating means associated with said reproduction unit for determining a precise positional location where information is being read on a record disc when the reading operation is interrupted;

memory means electrically connected said locating means for storing the positional location where information is being read on the first record disc when the reading operation is interrupted and switched to the second record disc in response to operation from the external source; and



signal generating means for generating a first request signal in response to operation from the external source representing the activation of a reading operation on the second record disc and the interruption of the reading operation on the first record disc, and a second request signal in response to operation from the external source representing the termination of the reading operation on the second record disc and the resumption of the reading operation on the first record disc;

said control means being connected to receive and responsive to the first request signal from said signal generating means to product a first control signal to activate the reproduction unit to read information on the second record disc and responsive to the second request signal from said signal generating means to produce a second control signal to activate the reproduction unit to resume reading information on the first record disc at the positional location stored in said memory means.

4,706,234

HEAD FEED CONTROL APPARATUS

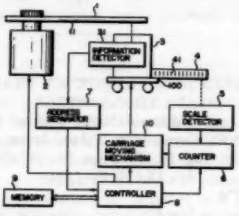
Hiroo Okada, Ina, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1986, Ser. No. 838,107

Claims priority, application Japan, Mar. 19, 1985, 60-54886

Int. Cl.[4] G11B *17/06*

U.S. Cl. 369—41 **7 Claims**



1. A head feed control apparatus, comprising:

scale means having graduations of a certain pitch, for measuring a feed amount of a head relative to a recording medium having recording tracks at a pitch smaller than said certain pitch;

sampling means for moving the head by a predetermined number of graduations of said scale means, and for counting the tracks of the recording medium within the predetermined number of graduations;

means for storing a ratio of a number of tracks counted by said sampling means, to the predetermined number of graduations; and

head feed control means for feeding the head a desired number of tracks between a current track and a target track, in accordance with the ratio stored by said storing means.

4,706,235

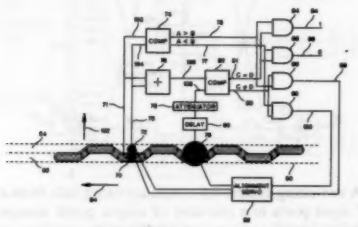
DIFFERENTIAL TRACK RECORDING

Hartvig E. Melbye, Boulder County, Colo., assignor to Storage Technology Partners 11, Louisville, Colo.

Filed Jan. 25, 1985, Ser. No. 694,875

Int. Cl.[4] G11B *7/013, 21/10*

U.S. Cl. 369—46 **5 Claims**



1. In an optical disk data storage device including a rotating disk storage medium, a method of detecting differentially recorded binary data contained in a data track on said medium, comprising the steps of:

(a) shining first and second read beams to illuminate respective first and second parts of said data track;

(b) detecting light received from said first and said second read beams and converting said detected light into respective first and second control signal values;

(c) comparing said first and second control signal values; and outputting a binary one signal when said first control signal value is greater than said second control signal value; and

(d) outputting a binary zero signal when said second control signal value is greater than said first control signal value.

4,706,236

SLICE LEVEL CORRECTOR

Yoshiro Yoda, Tama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 826,040

Claims priority, application Japan, Feb. 8, 1985, 60-23785

Int. Cl.[4] G11B *5/09, 5/02*

U.S. Cl. 369—59 **4 Claims**

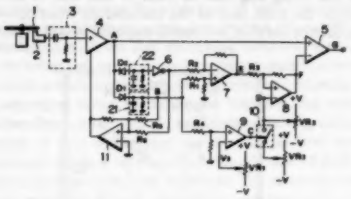
1. A slice level corrector, comprising:

(a) transducer means for reading a signal from a medium in which binary-coded information is recorded;

(b) detecting means coupled to said transducer means for detecting an information signal having no dc component;

(c) first comparator means coupled to said detecting means for comparing the detected information signal with a slice signal to generate a series of binary-coded information signals; and

(d) envelope detecting means for detecting the envelope of the information signal and for generating the slice signal in accordance with the detected envelope signal such that the voltage level of the slice signal corresponds to the dc



voltage level of the information signal when the information signal is detected.

4,706,237

DISC PLAYER WITH STROBE LIGHT ILLUMINATION

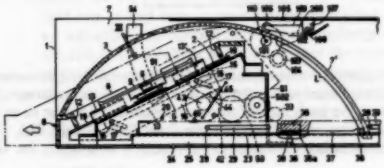
Mitsuhisa Nakayama, Kanagawa, Japan, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 25, 1985, Ser. No. 779,769

Claims priority, application Japan, Oct. 5, 1984, 59-150282[U]; Oct. 5, 1984, 59-150283[U]; Nov. 2, 1984, 59-230348

Int. Cl.[4] G11B *17/04, 3/62*

U.S. Cl. 369—75.1 **16 Claims**



1. A disc player, comprising a housing, a rotatable turntable having a non-vertical axis and a pressure member for urging the disc against the turntable, which member is positioned coaxially to the axis of the turntable and is movable toward and from the turntable, characterized in that

the turntable is located in the housing in such position that it is visible viewed at the front of the housing,

the turntable is covered with a cover, which has a transparent front surface and which is movably arranged at the front of the housing between an opened and a closed position,

the pressure member is located on a pressure arm, which is movable toward and from the turntable and is formed as an elongated frame which carries the pressure member in its middle part

a strobe light emitting device is located on said pressure arm to illuminate the surface of the disc when it is urged against the turntable, said strobe light emitting device emitting light at a frequency with the same period as a single rotation of the disc and comprising two strobe light emitters, said emitters being carried by said elongated frame on either side of said pressure member.

4,706,238

CLOCK

Hiroyuki Kizawa, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1986, Ser. No. 876,374

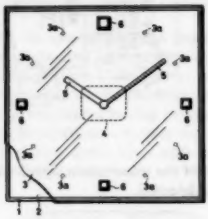
Claims priority, application Japan, Jun. 19, 1985, 60-92487[U]

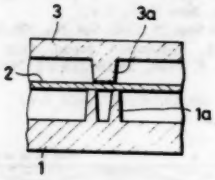
Int. Cl.[4] G04B *37/00*

U.S. Cl. 368—296 **8 Claims**

1. In a clock comprising a capsule having a timepiece move-

ment therein, an install plate for firmly supporting said capsule thereon, a dial having a front face and being disposed in front of said install plate, a transparent front cover having a back face and being disposed in front of said dial to define a gap between the back face of the transparent front cover and the front face of the dial, and hands disposed in said gap and driven





by said timepiece movement to indicate time; the improvement wherein said transparent front cover has projections integrally formed on the back face of the transparent front cover so as to come close to or abut against the front face of said dial, the projections being arranged to represent a time scale for the hands.

4,706,239

COMMUNICATIONS SATELLITE REPEATER

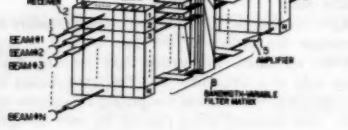
Yasuhiko Ito, and Hideyuki Shinonaga, Saitama, both of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1985, Ser. No. 810,144

Claims priority, application Japan, Dec. 24, 1984, 59-271040

Int. Cl.[4] H04Q *11/02;* **H04J** *1/10;* **H04B** *7/185*

U.S. Cl. 370—57 **3 Claims**



1. A communications satellite repeater for a multibeam satellite in which a satellite communications band for each beam is divided into a plurality of first channels by an input demultiplexer, each first channel having a first bandwidth, wherein each of said first channels are interbeam-connected by a filter matrix, which is operatively connected to output multiplexers and provides outputs thereto, and wherein said filter matrix comprises:

filter banks coupled to the outputs of said input demultiplexers for providing a plurality of second channels by dividing each of said first channels, each second channel having a second bandwidth narrower than said first bandwidth;

switches coupled with said filter banks to inter-beam connect said second channels; and

multiplexers for multiplexing the second channels at the output of said switches to provide output channels to said output multiplexers, whereby a plurality of inter-beam connections are established within each first bandwidth.

4,706,240

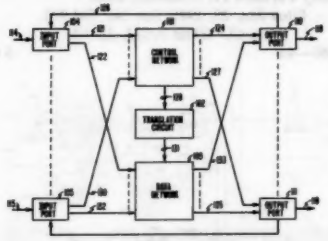
SWITCHING SYSTEM HAVING MULTIPLE PARALLEL SWITCHING NETWORKS

William A. Payne, III, Lombard, Ill., assignor to American Telephone and Telegraph Co., AT&T Bell Labs, Murray Hill, N.J.

Filed Nov. 29, 1985, Ser. No. 803,091

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—60 **22 Claims**



1. A switching system for communicating data from a plurality of input ports to a plurality of output ports, comprising

a first switching network of a self-routing type responsive to a path request from one of said input ports for establishing the requested path through said first switching network;

second switching network of a type other than self-routing for communicating the data from said plurality of input ports to said plurality of output ports;

said first switching network comprising means responsive to said path being set up through said first switching network for generating signals to control said second switching network;

means for translating the generated signals to convert the path through said first network for use in controlling said second switching network;

said second switching network responsive to the translated signals for establishing a path for the communication of data from said one of said input ports to one of said output ports; and

said first switching network further comprises means for indicating that a data path has been set up through said second switching network to said one of said output ports.

4,706,241

LOW SPEED GATE CIRCUIT

Gregg D. Carse, Mountain View, Calif., assignor to Pacific Bell, San Francisco, Calif.

Continuation-in-part of Ser. No. 711,083, Mar. 12, 1985, abandoned. This application Dec. 30, 1985, Ser. No. 814,632

Int. Cl.[4] H04M *11/04;* **H04Q** *11/04;* **G08C** *15/08*

U.S. Cl. 370—60 **16 Claims**

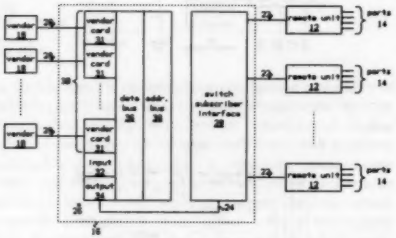
1. In a telephone system which includes one or more ports located on a subscriber's premises for connecting equipment on said premises to a specified vendor or services located at a location remote from said premises, said telephone system including means for generating a time multiplexed input serial data stream comprisng a plurality of digital words in a serial format, each said digital word representing a data word input

on a specific port, said port being specificed by the position of said digital word in said input serial data stream relative to a synchronization signal present in said telephone system and said telephone system further including means for receiving a time multiplexed output serial data stream comprising a plurality of digital words in serial format, each said data word representing a data word to be sent to a specified port, said port being determined by position of said digital word in said output serial data stream relative to said synchronization signal, a gate circuit comprising:

means for coupling said gate circuit to said generating means;

means for coupling said gate circuit to said receiver means;

vendor coupling means for coupling said gate circuit to each of said vendors, said vendor coupling means coupling each said vendor to said gate circuit by a telephone circuit, means for sending output data packets to each said vendor including means for generating signals representing said output data packets on the said telephone circuit coupling said vendor to said gate circuit, each said output data packet including one or more data words from a



specified port and information specifying said port, and means for receiving input data packets from each said vendor including means for receiving signals representing said input data packets on the said telephone circuit coupling said vendor to said gate circuit, each said input data packet including one or more data words to be sent to a specified port and information specifying said port;

serial input interface means connected to said input serial data stream coupling means for determining the vendor to which each digital word in said input serial data stream is to be sent and for coupling the data word specified by each said digital word and information specifying the port in which said digital word originated to said vendor coupling means; and

serial output interface means connected to said output serial data stream coupling means and said vendor coupling means for placing a data word received from a vendor which is to be sent to a specified port into said output serial data stream at a location relative to said synchronization pulse which will cause said data word to be sent to the port specified in the input data packet in which it was received from said vendor.

4,706,242

DIGITAL TELECOMMUNICATION SYSTEM

Geoffrey Harland, Barnston, Great Britain, assignor to STC plc, London, England

Filed Mar. 3, 1986, Ser. No. 835,219

Claims priority, application United Kingdom, Mar. 28, 1985, 8508174

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—60 **2 Claims**

1. An automatic telecommunication system which includes:

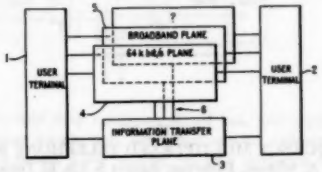
a number of subscriber's terminals served by the system;

a first switching network to which said subscriber's terminals have access; and

one or more further switching networks each of which provides services different from that provided by the first switching network, each of said one or more further switching networks being accessible from at least some of the subscriber's terminals;

wherein a connection between two of said subscriber's terminals is initially set up under control of control means associated with the first switching network, said connection being set up in digital packet-switched manner via said first switching network, information relating to said connection being interchanged between the connected subscriber's terminals via said first switching network;

wherein if said connection set up via the first switching network needs a service available via one of said one or more further switching networks, the subscriber's terminals involved in said connection are provided a further connection via said one of said one or more further switching networks in circuit-switched manner;



wherein for the establishment of said further connection via said one of said one or more further switching networks, all signalling and control information exchange is effected via said first switching network, so that the control means of said first switch network is involved in each said further connection set up via said one of said one or more further switching networks, the further conection via said one of said one or more further switching networks being set up in parallel with the connection set up via the first switching network;

and wherein each said further connection set up via said one of said one or more further switching network or networks is set up or broken down under the control of the first switching network and said control means, each said further connection set up via said one of said one or more further switching networks being only retained in use as long as that network's service is needed for said connection.

4,706,243

SINGLE-CHANNEL-PER-CARRIER COMMUNICATION SYSTEM INCLUDING A VOICE-ACTIVATED TRANSMISSION POWER CONTROLLER

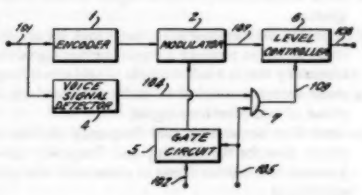
Toshitake Noguchi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed May 30, 1985, Ser. No. 739,135

Claims priority, application Japan, Jun. 1, 1984, 59-112653

Int. Cl.[4] H04J *1/00*; H01Q *11/12*

U.S. Cl. 370—69.1 **7 Claims**



1. A single channel-per-carrier modulation system comprising:

modulator means for modulation an input carrier wave in response to an input channel signal and providing a modulated carrier wave;

detector means for detecting the presence of the input channel signal;

gate circuit means responsive to a channel connection signal for supplying the input carrier wave to the modulator means only when the channel connection signal indicates that the associated channel is in the connection; and

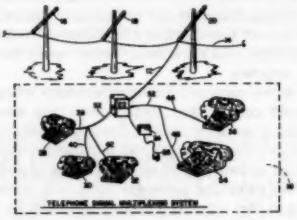
level control means responsive to at least the output of the detector means for imparting to the modulated carrier wave a predetermined attenuation when the associated channel is in connection but there is no input channel signal present, whereby the modulated carrier wave is continuously transmitted when the associated channel is in connection, regardless of the presence or absence of an input channel signal.

4,706,244

FREQUENCY MULTIPLEXED TELEPHONE SYSTEM

George A. Watson, Fullerton; Ramon S. Co, El Toro; James L. Fuhrman, Tustin, and Frank Avella, Irvine, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 15, 1985, Ser. No. 692,597
Int. Cl.[4] H04J *1/02*
U.S. Cl. 370—69.1 **16 Claims**



1. A frequency division multiplexed telephone system for connection to a subscriber telephone line, said system comprising:

a common conductor cable;

a line adapter unit for coupling said common conductor cable to said subscriber telephone line, and having a pilot tone generator for producing a pilot tone signal on said common conductor cable; and

a plurality of telephone sets coupled to said cable for producing frequency division multiplexed signals on said cable, each of said telephone sets including:

a clock for producing a clock signal having a clock frequency;

a frequency divider coupled to said clock for dividing said clock signal to produce a digital carrier signal having a frequency that is a sub-multiple of said clock frequency;

a phase detector coupled to said cable for detecting the phase of said pilot tone signal;

a controller connecting said frequency divider to said phase detector for causing said frequency divider to generate said carrier signal in phase with said pilot tone signal; and

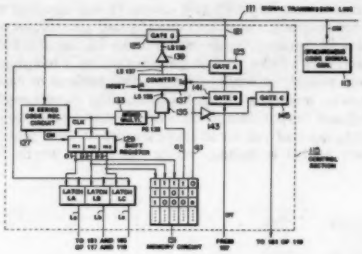
a modulator coupled to said common conductor cable and to said frequency divider for modulating a voice signal onto said carrier signal.

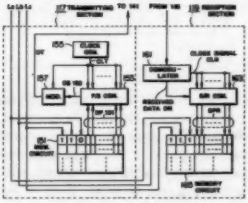
4,706,245

NETWORK SYSTEM

Tadashi Suzuki, Yokohama; Minoru Tomikashi, Zushi; Toru Futami, and Atsushi Sakagami, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 27, 1985, Ser. No. 786,935
Claims priority, application Japan, Oct. 1, 1984, 59-206043
Int. Cl.[4] H04J *3/02, 3/06;* H04L *7/06*
U.S. Cl. 370—85 **9 Claims**





1. A network system, comprising:

(a) a single-wire common signal transmission line for transferring a serial bit data string between a plurality of data processing stations connected thereto;

(b) first means for repeatedly generating an address information bit signal based on a predetermined time series code for each predetermined synchronization timing, modulating each address information bit signal into a synchronous signal having predetermined pulsewidths which are dependent on bit status information of each address information bit signal and outputting the modulated synchronous signal to the common signal transmission line so as to be superposed on the serial bit data string;

(c) second means provided within each station for receiving the synchronous signal on the signal transmission line derived from said first means and extracting the bit status information of the predetermined time series code from the received synchronous signal on the basis of the pulsewidth of the received synchronous signal from the common signal transmission line;

(d) third means for determining a bit combination pattern of a predetermined bit length inherent in the predetermined time series code from the predetermined time series code comprising the bit status information extracted by said second means; and

(e) fourth means for determining an operation mode of the station from the bit combination pattern determined by said third means.

4,706,246

DIGITAL SIGNAL TRANSMISSION SYSTEM

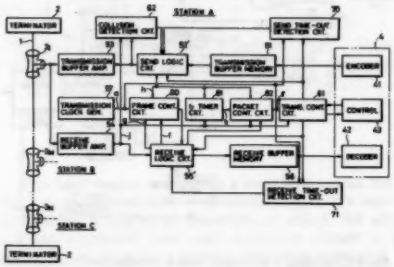
Hiroshi Kume, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1985, Ser. No. 758,004

Claims priority, application Japan, Jul. 23, 1984, 59-152375; Jul. 23, 1984, 59-152376

Int. Cl.[4] H04B 9/00

U.S. Cl. 370—85 11 Claims



1. In a digital signal transmission system having a plurality of individual stations coupled to a communications cable via taps, said stations transmitting time-division multiplexed digital signals on said communications cable with fixed time positions being assigned to said signals within periodically repeated time base frames, said frames being subjected to further divisions so that individual ones of said stations transmit packets which occupy specific time periods in said frame, some of said signals being from stations operating in a first mode, in which collisions between data packets transmitted from different stations are detected and the transmitting stations retry transmission after waiting a predetermined interval, and others of said signals being from stations operating in a second mode, in which collisions between data packets transmitted from different stations are detected and the transmitting stations retry transmission according to whether or not a carrier is present, the improvement comprising: in said stations operating in said second mode, send logic circuit means for preventing stopping of digital signal transmission from a station even if a collision occurs with a signal transmitted from said station in said first mode; and receive logic circuit means for preventing stopping of digital signal reception even if a collision is detected after start of digital signal reception.

4,706,247

DATA TRANSMISSION APPARATUS

Kazuo Yoshioka, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1985, Ser. No. 808,730

Claims priority, application Japan, Dec. 14, 1984, 59-262854

Int. Cl.[4] H04J 3/02, 3/00

U.S. Cl. 370—85 4 Claims

1. A data transmission apparatus comprising:

bus means including a data bus, a bus-clock bus, and a data-validating signal bus;

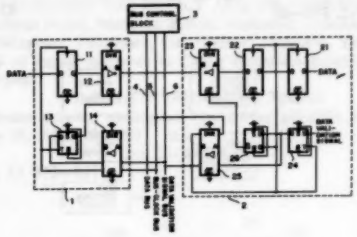
a bus control block connected to said bus means and including means for delivering a bus clock to said bus-clock bus;

a first data generating block connected to said bus means and synchronized by said bus clock;

said first data generating block including a first data latch for latching continuously generated data to be optionally transmitted to said data bus, first validating signal latch means for latching a data validating signal indicating the data to be valid, and first output means which, when the data validating signal is latched by said first validating signal latch means, outputs the data validating signal to the data validating signal bus and outputs the data latched by said first data latch to said data bus; and

a second data generating block connected to said bus means and synchronized by said bus clock;

said second data generating block including a second data latch for latching continuously generated data to be optionally transmitted to said data bus, second validating signal latch means for latching the data validating signal



input from said data validating signal bus, and second output means which, only when said second validating signal latch means is not latching the data validating signal, is allowed to deliver the data latched by said second data latch to said data bus whereby a composite data signal is produced from selected portions of the continuously generated data signals from said first and second data generating blocks.

4,706,248

SEMICONDUCTOR INTEGRATED CIRCUIT WITH ERROR CORRECTION FUNCTION INCORPORATED THEREIN

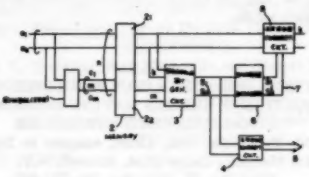
Yoshifumi Masaki, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 15, 1985, Ser. No. 723,507

Claims priority, application Japan, Apr. 13, 1984, 59-75542

Int. Cl.[4] G06F 11/00

U.S. Cl. 371—3 5 Claims



1. A semiconductor integrated circuit, comprising:

input means for receiving information;

memory means for storing the information received at said input means;

error detection means for detecting the occurrence of an error in the reception of said information and producing an error detection signal indicative thereof;

error correction means, responsive to said error detection signal, for correcting the error so detected; and

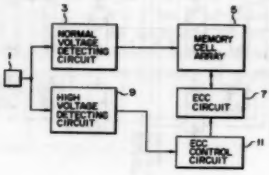
judgment means, responsive to the detection of an error by said error detection means, for producing a judgment signal indicative of an operation of said error correction means in response to the error detection signal produced by said error detection means.

4,706,249

SEMICONDUCTOR MEMORY DEVICE HAVING ERROR DETECTION/CORRECTION FUNCTION

Kaoru Nakagawa; Mitsugi Ogura, both of Yokohama; Kenji Natori, Kawasaki, and Fujio Masuoka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 3, 1985, Ser. No. 804,177
Claims priority, application Japan, Dec. 4, 1984, 59-256150
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—38 **12 Claims**



1. A semiconductor memory device having an error detection/correction function, comprising:

a memory cell array consisting of a plurality of memory cells for storing data;

means for receiving data to be stored in said memory cell array, generating parity data of the data, and storing the data and the parity data in said memory cell array;

means for reading out the data and the corresponding parity data stored in said memory cell array;

error correcting means consisting of parity check means for performing a parity check of the data read out by said readout means, in accordance with the data and the corresponding parity data read out from said memory cell array by said readout means, amd corrected data generating means for correcting an error of the data and the corresponding parity data read out from said memory cell array in accordance with an output from said parity check means, and for outputting corrected data and corrected corresponding parity data; and

control means, responsive to a control signal, for selectively controlling said error correcting means in a first operation mode for correcting an error of the data and the corresponding parity data read out by said readout means and outputting corrected data and corrected corresponding parity data, and, in a second operation mode, for outputting the data and the corresponding parity data from said readout means.

4,706,250

METHOD AND APPARATUS FOR CORRECTING MULTIBYTE ERRORS HAVING IMPROVED TWO-LEVEL CODE STRUCTURE

Arvind M. Patel, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 27, 1985, Ser. No. 781,449
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—39 **23 Claims**

1. A multibyte error-correcting system operable to correct up to t_1 errors in each subblock of a block of data and t_2 errors in said block, where t_2 and t_1 are positive integers and $t_2 > t_1$, said block having:

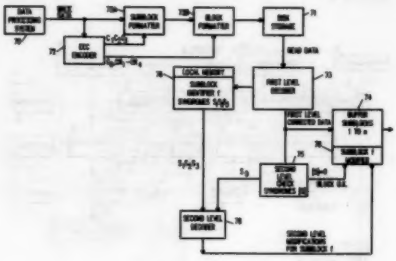
(a) at least one subblock, each of which has at least one codeword containing up to 2^b b-bit character positions, where b is any positive integer, each codeword consisting of a unique combination of data and $2t_1+c$ check bytes where c is an integer such that $t_1 \geqq c \geqq 1$; and

(b) up to $2t_2$ b-bit block check bytes, said system comprising:

first syndrome generating means receiving said codeword for generating $2t_1+c$ syndrome bytes, each containing b bits, corresponding to said $2t_1+c$ check bytes associated with each codeword, said check bytes corresponding to the modulo 2 sum of bit positions of said codeword selected systematically in accordance with a predetermined partiy check matrix;

first syndrome processing circuitry operable to correct up to t_1 errors and detect up to t_1+c errors in each said codeword by processing said $2t_1+c$ syndrome bytes;

second syndrome generating means receiving said block of input data for generating up to $2t_2$ block syndrome bytes



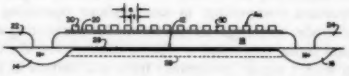
each contaiing b bits, said block syndrome bytes generated by combining said received block check bytes with block check bytes developed after all said codewords of said block have been received and corrected by said first syndrome processing circuitry, each of said block check bytes corresponding to the modulo 2 sum of bit positions of corrected said codewords that are selected systematically in accordance with said parity check matrix.

4,706,251

VOLTAGE TUNABLE COHERENT LIGHT SOURCE

Mehmet Rona, Belmont, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Mar. 18, 1985, Ser. No. 713,248
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—4 **7 Claims**



1. A source of substantially coherent radiation, said source comprising:

means for forming a thin layer of electrons said means for forming electrons comprising a p-type substrate selected from the group consisting of gallium arsenide, indium antimonide and indium phosphide having at least two n-type portions diffused into a surface of said substrate, an insulation layer of electrically insulative material disposed on said surface between said portions and a thin layer of electrically conductive material disposed on said insulation layer, wherein said layer of electrons is formed at said surface in response to a potential applied to said thin layer so that electrons in said substrate are attracted toward said thin layer to said surface of said substrate;

grating means spaced from said thin layer of electrons; and

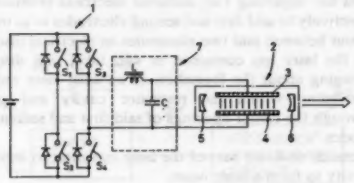
means for obtaining a substanially constant DC charge through said thin layer of electrons wherein at least a portion of said thin layer of electrons oscillates responsively to said DC charge to provide a plasma wave, said grating means being spaced from said plasma wave such that electrons in said grating means couple with said plasma wave so as to emit said coherent radiation.

4,706,252

LASER DEVICE OF AC DISCHARGE EXCITATION TYPE

Akira Egawa, Hiratsuka, and Ryoichi Noudomi, Fujisawa, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 14, 1985, Ser. No. 765,862
Int. Cl.[4] H01S 3/00; H05B 41/14
U.S. Cl. 372—38 **13 Claims**



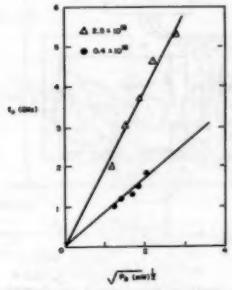
1. A laser device comprising a switching circuit for switching a direct current into an alternating current; a laser oscillator having a discharge electrode to which the alternating current outputted from said switching circuit is applied, wherein an alternating current discharge generated by said discharge electrode acts as a laser excitation source; and a frequency filter interposed between said switching circuit and said discharging electrode for making the wave shape of the discharge current flowing between said discharging electrodes either one of a sine curve and substantially a sine curve.

4,706,253

HIGH SPEED INGAASP LASERS BY GAIN ENHANCEMENT DOPING

Chin B. Su, Newton; Vincent A. Lanzisera, Northboro, and Richard I. Freeman, Reading, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 15, 1985, Ser. No. 734,131
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—44 **14 Claims**



1. In a high speed InGaAsP semiconductor laser comprising:
(a) an n-type InP substrate;
(b) an n-type InP confinement layer;
(c) a p-type active layer of the formula:

$$Ga_xIn_{1-x}As_yP_{1-y}$$

wherein;
$0<x\leqq 0.27$ and $0<y\leqq 0.59$;
(d) a p-type InP confinement layer; and
(e) a p-type InGaAsP cap layer;
the improvement comprising:
doping said active layer with a p-type dopant, at an impurity concentration of at least about 2.5×10^{18} cm^{-3} such that the modulation bandwith of said laser is increased according to the equation:

$$BW=\sqrt{(A)(P_b/L)}$$

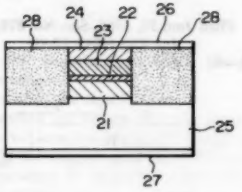
wherein, P_b is the bias optical power, L the laser cavity length, and A the gain constant.

4,706,254

SEMICONDUCTOR DEVICE AND ITS FABRICATION

Hidetoshi Nojiri, Matsudo; Seiichi Miyazawa, Yokohama; Isao Hakamada, Yokohama, and Yoshioki Hajimoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 9, 1984, Ser. No. 608,510
Claims priority, application Japan, May 12, 1983, 58-83919; May 25, 1983, 58-92989
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—46 **2 Claims**



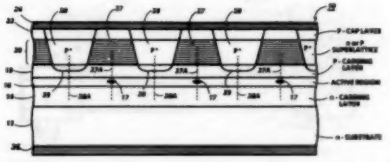
1. A semiconductor device, comprising:
(a) substrate;
(b) a plurality of monocrystalline semiconductor layers including a laser active layer, said semiconductor layers constituting a resonator in a mesa-stripe construction formed on said substrate; and
(c) an amorphous semiconductor layer formed on said substrate in a manner to bury said monocrystalline semiconductor layers with respect to a breadthwise direction of the resonator so as to confine light in the active layer, said amorphous semiconductor layer being made of one of amorphous silicon and amorphous germanium.

4,706,255

PHASED ARRAY SEMICONDUCTOR LASER WITH PREFERRED EMISSION IN THE FUNDAMENTAL SUPERMODE

Robert L. Thornton, East Palo Alto, and Robert D. Burnham, Palo Alto, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 20, 1985, Ser. No. 736,040
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—50 **16 Claims**



1. In a phased array semiconductor laser comprising a series of lasing elements formed in a plurality of semiconductor layers including an active region formed between a pair of cladding layers for providing light wave generation and propagation under lasing conditions, said elements each comprising

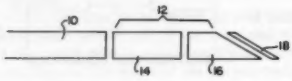
an optical guide region for optical field containment of said propagating light and wherein the optical field of each of said lasing elements are coupled to provide a phase locked condition across the array, the improvement comprising a disorderable structural means formed in at least one of said cladding layers, regions of said disorderable cladding layer adjacent to said optical guide regions subjected to impurity induced disordering to form said optical guide regions and to produce therein higher gain compared to the gain experienced in said optical guide regions to thereby spatially modulate the current distribution across said array so that the integral of the gain of the optical field present in said active region of said laser is higher in said adjacent disordered regions compared to said optical guide regions.

4,706,256

FRITLESS ENDBELL ASSEMBLY

Shinan-Chur S. Sheng, Sunnyvale; Jeffrey Kaiser, Mountain View; Ralph R. Jacobs, Fremont, and Alan B. Petersen, Palo Alto, all of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Jun. 20, 1986, Ser. No. 876,559
Int. Cl.⁴ H01S *3/03*
U.S. Cl. 372—61 **23 Claims**



1. A fritless endbell assembly operatively associated with a laser body, comprising:

a crystalline endbell component;

a crystalline optical component optically contacted, thermally cycled and hermetically sealed to said crystalline endbell component, forming substantially a unitary continuous crystalline structure between said optical component and said crystalline endbell assembly; and

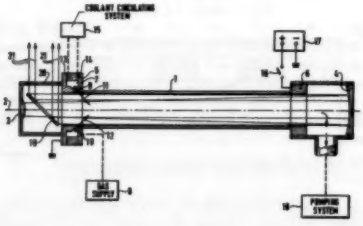
a metal endbell component attached to said laser body and said crystalline endbell component.

4,706,257

GAS LASER GENERATOR AND METHOD OF OPERATING SAME

Henri Brunet, L'Hay les Roses; Michel Mabru, Bures sur Yvette, and Michel Gastaud, Sainte Genevieve des Bois, all of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Nov. 27, 1985, Ser. No. 802,294
Claims priority, application France, Nov. 29, 1984, 84 18183
Int. Cl.⁴ H01S *3/097*
U.S. Cl. 372—88 **6 Claims**



1. A gas laser generator of the type comprising:

means for creating an optical resonator along one axis,

a discharge tube forming a part of said resonator along said axis,

means for introducing a laser gas into the tube,

means for aspirating the laser gas out of said tube,

first and second cylindrical electrodes fixed to said tube at longitudinally spaced positions and each having a center opening, said electrodes being disposed along said axis so as to be in contact with the laser gas introduced into said tube,

means for imparting two different electrical potentials respectively to said first and second electrodes so as to bring about between said two electrodes an electrical discharge in the laser gas contained in said tube, said discharge bringing about the formation of an axial laser radiation oscillating within the resonator cavity and passing through the center openings of said first and second electrodes.

and means enabling part of the laser radiation to leave said cavity to form a laser beam,

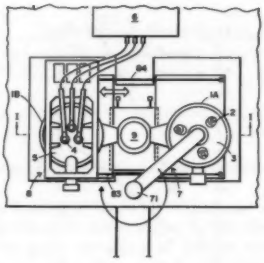
the improvement wherein said means for introducing said laser gas into said tube include gas injection channels arranged in the first electrode, said injection axes of said channels intersecting said axis of said resonator, being directed towards said second electrode and being inclined at an angle of substantially 45° with respect to said axis of said resonator, and the number and the cross-section of said channels being such that said laser gas is injected into said tube at a velocity at least equal to the velocity of sound.

4,706,258

SCRAP MELTING METHOD

Saburo Sugiura; Kenji Kanada, both of Aichi; Noboru Demukai, Gifu, and Tetsuo Okamoto, Aichi, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Aichi, Japan

Filed Sep. 8, 1986, Ser. No. 904,591
Claims priority, application Japan, Sep. 10, 1985, 60-200229
Int. Cl.⁴ H05B *7/18*
U.S. Cl. 373—2 **6 Claims**



1. A scrap melting method employing an electric arc furnace, which comprises:

(a) heating said scrap by a powdered coal burner, under conditions wherein said scrap is heated by said powdered coal burner until the average temperature of said scrap reaches a predetermined temperature of not higher than 1200° C., while not less than 70% of the oxygen required to burn said powdered coal is supplied from air, and wherein the chemical composition of the exhaust gases meets the following formula

$$CO/CO+CO_2+N_2)<10\%,$$

followed by;

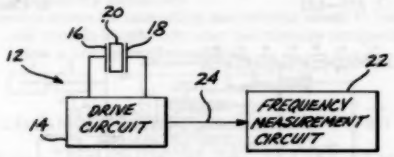
(b) heating said scrap by said electric arc so as to melt said scrap.

4,706,259

MOUNTING AND ISOLATION SYSTEM FOR TUNING FORK TEMPERATURE SENSOR

Jerome M. Paros, Kirkland; Jeffrey F. Tonn, Tacoma, and Richard B. Wearn, Jr., Seattle, all of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Dec. 30, 1985, Ser. No. 815,352
Int. Cl.[4] G01K 11/22
U.S. Cl. 374—117 5 Claims



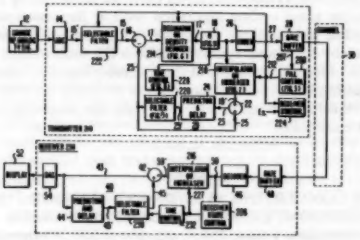
1. A mounting and isolation system for a tuning fork temperature sensor that includes a tuning fork having a frequency of oscillation that is a function of temperature, the mounting and isolation system comprising a mounting member having a surface shaped so as to permit the mounting member to be rigidly connected to an external support, and an elongated support structure connecting a selected point on the tuning fork to the mounting member such that the tuning fork is supported solely by the support structure, the dimensions of the support structure selected so as to comprise a low pass mechanical filter that is adapted to transmit only vibration frequencies that are less than the operating range of frequencies of the tuning fork.

4,706,260

DPCM SYSTEM WITH RATE-OF-FILL CONTROL OF BUFFER OCCUPANCY

Nicola J. Fedele, Kingston, N.J., and Alfonse A. Acampora, Staten Island, N.Y., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 7, 1986, Ser. No. 928,042
Int. Cl.[4] H04N 7/13
U.S. Cl. 375—27 22 Claims



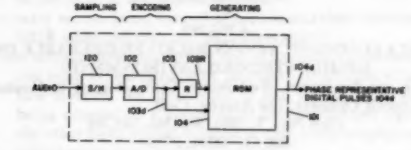
1. A method for communication by differential pulse code modulation, comprising the steps of:
- subtracting delayed predicted signals from input signals to produce difference signals;
- adding said difference signals to said delayed predicted signals to produce current predicted signals;
- at least delaying said current predicted signals to produce said delayed predicted signals;
- coding said difference signals to form codewords of variable length having a variable data rate;
- applying said codewords to a rate buffer at least part of the time for temporarily storing said codewords;
- reading said codewords from said rate buffer;
- generating a control signal representing the rate of fill of said rate buffer; and
- controlling the rate of fill of said rate buffer by means including said control signal.

4,706,261

DIFFERENTIAL PHASE MODULATION

Frank M. Torre, Smithtown; John F. Crush, Levittown, and Raymond J. Masak, Northport, all of N.Y., assignors to Hazeltine Corporation, Greenlawn, N.Y.

Continuation-in-part of Ser. No. 407,982, Aug. 13, 1982, abandoned. This application Mar. 20, 1985, Ser. No. 714,157
Int. Cl.[4] H04L 27/18
U.S. Cl. 375—27 21 Claims



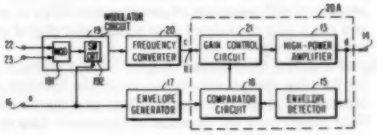
5. An apparatus for modulating a carrier wave with an analog signal comprising:
- (a) means for providing the signal;
- (b) means for sampling the amplitude of the signal every T seconds to provide sampled amplitudes corresponding to the amplitude of the analog signal every T seconds;
- (c) means for encoding in sequential order the sampled amplitudes into digital data pulses of pulse rate 1/T, each said digital data pulse having an amplitude corresponding to the amplitude of each sampled pulse;
- (d) means for generating phase representative digital pulses corresponding to the difference between the amplitude of each said digital data pulse and the amplitude of the digital data pulse previous to and contiguous with each said digital data pulse; and
- (e) means for phase modulating the phase representative digital pulses onto a sine wave thereby generating phase representative sine wave pulses which correspond to the analog signal; and
- (f) means for mixing said phase representative sine wave pulses with the carrier wave.

4,706,262

FSK OR FM BURST SIGNAL GENERATING APPARATUS

Kiyoshi Ohta, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 26, 1985, Ser. No. 716,270
Claims priority, application Japan, Mar. 30, 1984, 59-62805; Apr. 12, 1984, 59-73811; Feb. 6, 1985, 59-21445
Int. Cl.[4] H04L 25/49
U.S. Cl. 375—60 14 Claims



1. A burst signal generating apparatus comprising:
- a modulator circuit for modulating a carrier wave of an intermediate frequency with a modulating signal;
- switching means responsive to a burst control signal for switching on and off the modulated carrier wave of said intermediate frequency;
- a frequency converter circuit for converting the output of said switching means into a radio frequency;
- an amplitude control unit including a prebiassed high-pow-

ered amplifier and responsive to said burst control signal for controlling the amplitude of the carrier wave of said radio frequency; and

said amplitude control unit comprising said prebiassed high-power amplifier for power-amplifying the carrier wave of said radio frequency; an envelope detector circuit for branching the output of said prebiassed high-power amplifier and detecting the amplitude thereof; a comparator circuit for amplitude-comparing said burst control signal and the output of said envelope detector circuit to provide the resultant error signal: and a circuit responsive to said error signal for controlling the amplitude of the carrier wave of said radio frequency.

4,706,263

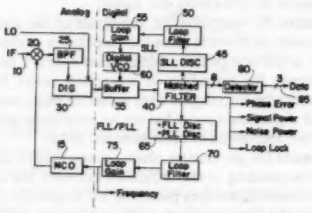
DATA COMMUNICATIONS RECEIVER OPERABLE IN HIGHLY STRESSED ENVIRONMENTS

U. A. von der Embse, Westchester, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 7, 1983, Ser. No. 549,701

Int. Cl.[4] H04L *27/06*

U.S. Cl. 375—96 **26 Claims**



1. A communication receiver for acquiring or tracking a signal modulated with data symbols at a binary symbol rate 1/T Hz, comprising:

first filter means having a nominal bandwidth for receiving the modulated signal;

means for positioning the bandwidth of said filter means at selectable positions in a predetermined spectral uncertainty band in response to positioning signals;

digitizer means including analog-to-digital converter (A/D) means coupled to said filter means and arranged to convert output signals from said filter means to a digital bit stream, the digitizer means also including means for sampling the digital stream, said A/D means arranged to sample said analog signal at an A/D sampling rate D Hz, where $D=K_{A/D}B$, and $K_{A/D}$ is an integer larger than one;

digital processor adapted to perform digital filtering and processing of said digital bit stream in accordance with a predetermined sequence of programmed steps to acquire and track said modulated data signal, said digital processor comprising;

digital matched filter means coupled to said digitizer means for forming energy accumulations of the spectral energy content in the spectral bandwidth of said digital matched filter means over the duration of respective data symbols modulating the modulated signal;

digital buffer means coupled to said digitizer means for holding the modulated signal

timing means arranged to synchronize the matched filter means to said modulated signal; the timing means further comprising a symbol lock feedback loop (SLL) which develops successive timing estimates based upon a SLL discriminant, and each of said estimates is used to develop a SLL signal that controls the digital buffer means; and

digital feedback loop means responsive to said matched filter means and arranged to provide said positioning signals to control the positioning of the bandwidth of said first filter means in said spectral uncertainty band.

4,706,264

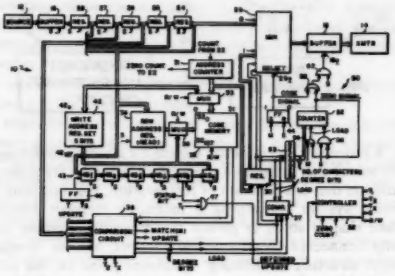
DIGITAL DATA COMPRESSION METHOD AND MEANS

David Cung, Palo Alto, Calif., assignor to Chung Telecommunications, Palo Alto, Calif.

Filed Jun. 22, 1983, Ser. No. 506,603

Int. Cl.[4] H04B *1/66*

U.S. Cl. 375—122 **10 Claims**



1. The method of compressing a digital data stream composed of plaintext symbols comprising the steps of

A. maintaining a code table of plaintext symbols at a transmitting location;

B. encoding blocks of plaintext symbols in the stream using said code table to produce codes for said blocks;

C. updating said code table according to an update algorithm;

D. transmitting the codes for said blocks plus only plaintext symbols in blocks not previously encoded to a receiving location;

E. maintaining a code table at the receiving location;

F. decoding the transmitted codes for said blocks using the code table at the receiving location to recover plaintext symbols in the data stream; and

G. updating the receiving location code table by applying to the plaintext symbols received from the transmitting location the same update algorithm used at the transmitting location so that the two code tables remain identical whereby the coded symbol blocks in the transmission can be decoded continuously at the receiving location without requiring the separate transmission of codes for said not previously encoded blocks to update the receiving location code table.

4,706,265

CODE CONVERTING SYSTEM AND METHOD FOR BAND COMPRESSION OF DIGITAL SIGNALS

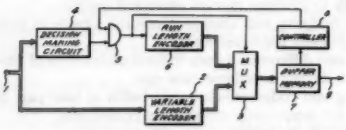
Akihiro Furukawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 30, 1985, Ser. No. 792,760

Claims priority, application Japan, Oct. 30, 1984, 59-228631

Int. Cl.[4] H04N *7/12*

U.S. Cl. 375—122 **20 Claims**



1. A code converting system comprising

first code converting means for converting a first code into a variable length code,

second code converting means for converting such first code into a run-length code,

selector means for receiving said variable length code and said run-length code and selecting one of said variable length code and said run-length code as its output,

memory means for receiving and storing the output of said selector means, supplying it to a transmission line, and generating a signal indicating the memory occupancy of said memory means, and

control means for controlling said selector means to output said variable length code when said memory occupancy is below a first predetermined level.

4,706,266

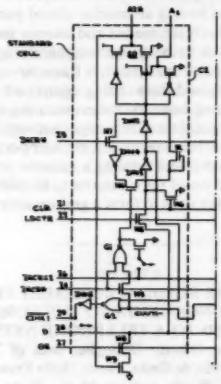
DUAL MODE-INCREMENT/DECREMENT N-BIT COUNTER REGISTER

Asif Qayyum, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 5, 1986, Ser. No. 927,308

Int. Cl.[4] H03K *23/52, 23/66*

U.S. Cl. 377—33 **20 Claims**



1. A counter cell for counting either up or down by one or two, said counter cell comprising:

a multiplexer section being formed of a first pass transistor and a second pass transistor whose sources are connected together and to an internal node, said first pass transistor having its drain coupled to a complement carryin-by-one signal and its gate coupled to an increment-by-one signal, said second pass transistor having its drain coupled to a complement carryin-by-two signal and its gate coupled to an increment-by-two signal;

an increment/decrement section being formed of a first two-input NOR gate, third through seventh pass transistors, and first through fourth inverters;

said first NOR gate having one of its inputs coupled to an increment strobe signal and its other input connected to the source of said third pass transistor, said third pass transistor having its drain connected to the internal node and its gate coupled to the increment strobe signal, said first NOR gate having its output connected to the gate of said fourth pass transistor;

said fourth pass transistor having its drain connected to the output of said fourth inverter and having its source connected to the source of said fifth pass transistor, the drain of said sixth pass transistor and the input of said first inverters;

said fifth pass transistor having its drain coupled to a preset data input signal and its gate coupled to a load-counter signal, said sixth pass transistor having its gate coupled to a clear-counter signal and its source connected to a ground potential;

said first inverter having its output connected to the input of said second inverter, said second inverter having its output connected to the input of said first inverter via a resistor, said second inverter having its output further connected to the input of said third inverter, the drain of said seventh pass transistor, and a first output terminal for generating an incremented output signal;

said third inverter having its output connected to a second output terminal for generating a decremented output signal, said seventh pass transistor having its gate coupled to the incremented strobe signal and its source connected to the input of said fourth inverter;

a carry section being formed of second and third two-input NOR gates and fifth and sixth inverters;

said second NOR gate having one of its inputs connected to one input of said third NOR gate and to the output of said first inverter, the other input of said second NOR gate being coupled to a complement carryout-by-one signal, the other input of said third NOR gate being coupled to a complement carryout-by-two signal;

said fifth inverter having its input connected to the output of said second NOR gate and its output coupled to a third output terminal for generating a complement carryout-by-one signal; and

said sixth inverter having its input connected to the output of said third NOR gate and its output coupled to a fourth output terminal for generating a complement carryout-by-two signal.

4,706,267

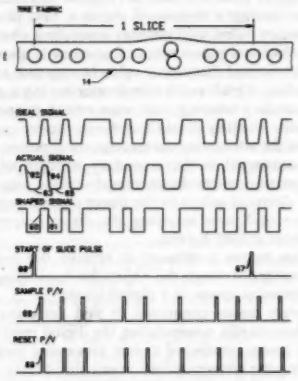
DEFECT DETECTOR FOR CORD REINFORCED TIRE FABRIC

Lee M. Chase, and David Sudikoff, both of Cupertino, Calif., assignors to Measurex Corporation, Cupertino, Calif.

Filed Dec. 30, 1985, Ser. No. 814,731

Int. Cl.[4] G01B *15/06;* **G01N** *23/02*

U.S. Cl. 378—61 **5 Claims**



1. A system for detecting missing or overlapping cords in cord reinforced tire fabric which comprises:

(a) a radiation source for providing a collimated beam of radiation through said tire fabric, said radiation being such that a greater amount of radiation will penetrate through the rubber of said fabric than through the cord of said fabric;

(b) a sensor aligned with said collimated beam of radiation for detecting said radiation and generating an electrical signal in response thereto;

(c) means for causing said radiation source and said sensor to scan across a section of said tire fabric at a predetermined speed;

(d) means responsive to said electrical signal generated by said sensor for providing a timing signal when said sensor bears a predetermined relationship to each edge of the cords in said fabric; and

(e) means responsive to said timing signals during a predetermined scan distance for measuring the total time a cord is between said radiation source and said sensor.

4,706,268

DIGITAL RADIOGRAPHY APPARATUS

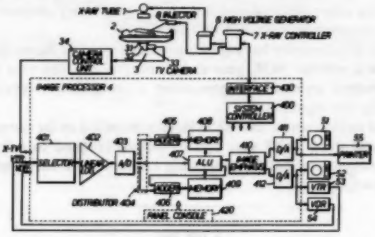
Toshihiro Onodera, Kunitachi, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Nov. 30, 1984, Ser. No. 676,834

Claims priority, application Japan, Nov. 30, 1983, 58-225717

Int. Cl.[4] H05G *1/64*

U.S. Cl. 378—99 **5 Claims**



1. Digital radiography apparatus for displaying an X-ray transmission image of an object, comprising:

a source of pulsed electrical power for generating direct current pulses having a voltage above a predetermined voltage value, said source of pulsed electrical power including an inverter, said inverter having a direct current power supply connected in series with a main switch to alternately open and close in response to a main switching signal having a frequency above a first predetermined frequency value, said inverter generating alternating current electrical pulses whose frequency is above a second predetermined frequency value in response to said main switching signal, and a transformer having a primary and a secondary winding, said main switch connected to the primary winding of said transformer to increase the voltage of the alternating current electrical pulses, and a rectifier connected to the secondary winding of said transformer to convert the increased-voltage alternating current electrical pulses to the direct current pulses;

a source of X-rays receiving the direct current pulses to generate pulsed X-rays;

detection means positioned to receive the pulsed X-rays transmitted through the object for converting the X-ray transmission image to a digital image;

processing means connected to said detection means for mathematically manipulating the digital image;

display means connected to said processing means for converting the mathematically manipulated image to a visible image; and

control means coupled to said processing means for driving said source of pulsed electrical power, said control means including first means for generating a plurality of control pulses whose duration corresponds to the duration of said pulsed X-rays, second means for generating a pluralty of pulses as the main switching signal to be supplied to said main switch, and gating means coupled to said first and said second means for regulating the supply of said main switching signal to said main switch in response to said control pulses

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4,706,269

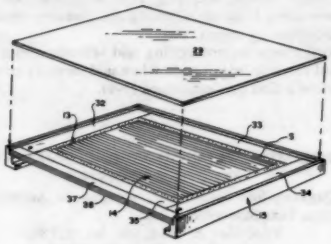
ANTI-SCATTER GRID STRUCTURE

Leo J. Reina, 103 S. River Rd., Fox River Grove, Ill. 60021, and William J. Antolik, 1125 N. Grove Ave., Palatine, Ill. 60067

Continuation-in-part of Ser. No. 710,280, Mar. 11, 1985, abandoned. This application Jul. 1, 1986, Ser. No. 881,184

Int. Cl.[4] G21K *1/00*

U.S. Cl. 378—154 **16 Claims**



1. An X-ray grid structure for assembly with a cassette comprissing a rectangular, flat panel comprised of a polycarbonate material and having an interior closed panel pocket, an X-ray grid protectively encased in said interior panel pocket of said flat panel so as to be protected therein against impact forces when applied to said panel, a frame around three side edges of said panel, said frame being comprised of a UHMW plastic for cushioning impacts, means securing said frame to said flat panel along said three side edges but with said securing means being spaced from said grid at its outer peripheral edges, and a groove in said frame forming a cassette pocket beneath one flat side of said panel for a cassette to be slidably received in the cassette pocket so as to form a grid cassette when assembled.

4,706,270

EQUIPMENT FOR SENDING DIGITALLY PRE-STORED VOICE ANNOUNCEMENTS TO THE SUBSCRIBERS CONNECTED TO A TELEPHONE NETWORK

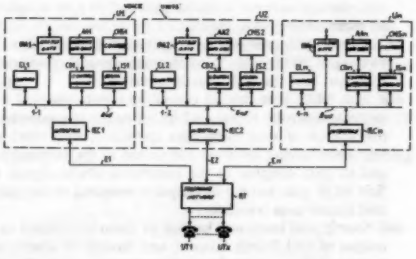
Luciano Astegiano; Ottavio Bertoglio, both of Turin; Fulvio Bosco, Asti; Alfredo de Bosio, Turin; Dario Franco, Avigliana; Piero Lampiano, Turin; Antonio Melle, Turin, and Luciano Rosboch, Turin, all of Italy, assignors to Societa' Italiana per l'Esercizio Telefonico p.a., Turin, Italy

Filed Mar. 20, 1986, Ser. No. 841,559

Claims priority, application Italy, Apr. 16, 1985, 67355 A/85; Apr. 16, 1985, 67356 A/85

Int. Cl.[4] H04M *3/26*

U.S. Cl. 379—2 **13 Claims**



1. An apparatus for sending digitally pre-stored voice announcements to subscribers connected to a telephone network, comprising at least one voice unit which is connected through several independent lines and without intermediate concentra-

tion stages to switching devices in the telephone network through which each line may be allotted to a subscriber requiring an announcement, each of said units comprising:

an announcement data base which stores in digital form all announcements to be supplied to the subscribers, including guidance announcements and control signals to be used for diagnostic purposes, the access to the data base taking place independently for each subscriber connected to the unit;

a computer which provides a bus to which the announcement data base is connected via a control interface and which manages the sending of the announcements to the subscribers, so that the subscriber who obtained the access to the equipment receives the announcement since the beginning and with a very reduced wait time, independently of the announcement length and the number of subscribers to whom the announcement is supplied, updates the data base, and supervises the apparatus through disabling of out-of-order parts; and

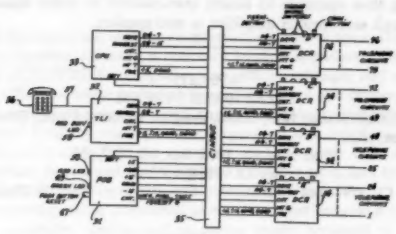
an interface connecting the unit with the network and connected to said bus of the computer, said interface temporarily storing the announcements or part of them taken from the data base by the computer and sent to the subscribers, managing the telephone connection between the subscriber and the equipment and carrying out diagnostic controls on correct apparatus operation.

4,706,271

COMMUNICATION LINES WITH TERMINATE AND LEAVE CAPABILITY-DC ALARM BRIDGE

Lawrence O. Hilligoss, Seal Beach, and William R. Hilligoss, Long Beach, both of Calif., assignors to Communications Technology Corporation, Los Angeles, Calif.

Filed May 3, 1985, Ser. No. 730,081
Int. Cl.[4] H04M *11/04, 3/12*
U.S. Cl. 379—49 **9 Claims**



1. In an apparatus for connecting a plurality of security loops in a DC series circuit with a monitoring station and utilizing line pairs for connection to the security loops, for the purpose of performing maintenance service on individual security loops, the combination of:

a bridge having a plurality of pairs of bridge terminals and providing a DC series circuit between said pairs of terminals;

circuit means for connecting one of said pairs of bridge terminals to the monitoring station;

a plurality of terminating direct connection lines;

a plurality of switch means, with each switch means selectively connecting another pair of bridge terminals to a communication line pair or to a terminating line, with said bridge, said terminating lines and said switch means positioned at a communication equipment location remote from said security loops and from said monitoring station; and

control means for actuating said switch means to selectively connect a bridge terminal pair to a corresponding communication line pair or to a corresponding terminating line with said control means separate from said DC circuit and functioning in response to a control signal from a signal source positioned at a location remote from said switch means;

said control means including means for actuating said switch means to

a. disconnect a selected one of said communication line pairs from and connect the corresponding one of said terminating lines to the corresponding one of said bridge terminal pairs,

b. disconnect said one terminating line from and connect said selected one communication line pair to said corresponding one bridge terminal pair, and

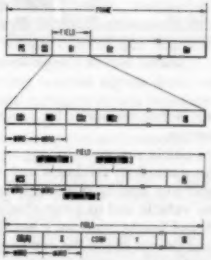
c. disconnect another communication line pair from another bridge terminal pair and connect another terminating line to said other bridge terminal pair.

4,706,272

PAGING COMMUNICATION SYSTEM

Izumi Nishimura, and Koichi Nagata, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Feb. 1, 1985, Ser. No. 697,334
Claims priority, application Japan, Feb. 14, 1984, 59-24337
Int. Cl.[4] H01Q *7/00*
U.S. Cl. 379—57 **12 Claims**



1. A paging communication system comprising:

a base station; and

a plurality of receivers divided into a plurality of groups, a group of said receivers being called in response to a paging signal transmitted from said base station;

said paging signal being composed of a train of frames each of which includes a plurality of fields corresponding to said groups of receivers, respectively, each of said fields being composed of a plurality of pairs of an individual calling code word, each of said code words containing an individual calling code which is assigned to each corresponding ones of said receivers and a message word containing a message which is addressed to the corresponding receiver, said message word being subsequent to said individual calling code word, each of said code words also including a group calling code word containing a group calling code which is common to the same group of receivers and a plurality of information words each of which includes an information addressed to the group subsequent to said group calling code word;

said base station comprising first means for counting the number of times that a transmission is made from said base station to each of said receivers, and second means operative to transmit first data indicating that the transmission of the information to a particular one or ones of said receivers is not allowed by putting the first data in the message word corresponding to the particular one of said receivers or by putting the first data in each message word which corresponds to each of the particular ones of said receivers;

each of said receivers comprising means for comparing the individual calling code transmitted from said base station

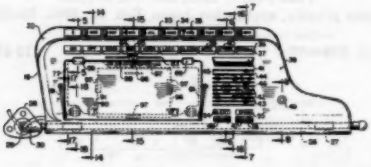
with its own individual calling code stored therein, means for indicating the corresponding message when the received individual calling code coincides with the stored individual calling code and for indicating the corresponding information when the received group calling code coincides with its own group calling code stored therein, and third means operative to inhibit an ordinary receiving processing of the information code in response to the first data transmitted from said base station.

4,706,273

CELLULAR TELEPHONE

A. Gil Spear, Vero Beach, Fla., and Anthony P. Palett, 31458 Hunters Cir., Farmington Hills, Mich. 48018, assignors to Anthony P. Palett, Farmington Hills, Mich.

Filed Nov. 14, 1985, Ser. No. 798,101
Int. Cl.[4] H04Q *7/04*; H04M *1/21*
U.S. Cl. 379—58 **23 Claims**



1. A compact mobile telephone for a motor vehicle comprising in combination:

(a) a motor vehicle sun visor having a casing whose width and height exceed its thickness and which is selectively positionable to a shading position for shading an occupant of a motor vehicle and to a non-shading position wherein the width and height confront a headliner in the vehicle's interior and do not shade the occupant, said visor having an occupant facing portion in the non-shading position;

(b) means for selectively positioning said sun visor to said shading and non-shading positions;

(c) an array of telephone operating controls mounted on the said occupant facing portion of the sun visor, such that when the visor is in said non-shading position, said controls are in the occupant's field of vision and are rendered accessible for actuation by the occupant while the occupant's attention is directed to the road; and

(d) electronic means mounted in the interior of said sun visor for transmitting, receiving and processing outgoing and incoming telephone calls.

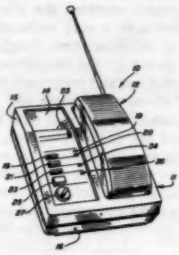
4,706,274

CORDLESS TELEPHONE SYSTEM

William Baker, Indianapolis; Michael K. Pedigo, Southport; Noel Atkinson, and Henry P. Shelton, both of Indianapolis, all of Ind., assignors to Southwestern Bell Telecommunications, Inc., St. Louis, Mo.

Filed May 11, 1984, Ser. No. 609,557
Int. Cl.[4] H04Q *7/04*
U.S. Cl. 379—61 **11 Claims**

1. In a cordless telephone system including a handset unit and a control unit each including transmitter means and receiver means for wireless communication between said units, each transmitter means having an audio signal input and each receiver means having an audio signal output, a line circuit in said control unit for connection to at least one outside line and including an input for receiving audio signals to be transmitted to the outside line and an output for transmission of signals received from the outside line, a speaker amplifier in said control unit having an input and an output, a speaker in said control unit connected to said speaker amplifier output, a microphone amplifier in said control unit having an input and an output, a microphone in said control unit connected to said microphone amplifier input, control means in said control unit for operation thereof in a plurality of modes including a "normal" mode and a "local answer" mode, said control means in said "normal" mode being arranged to connect said audio signal output of said control unit receiver means to said input of said line circuit and to connect said output of said line circuit to said audio signal input of said control unit transmitter means while inhibiting transmission of audio signals to and from said speaker amplifier input and said microphone amplifier output, said control means in said "local answer" mode being arranged



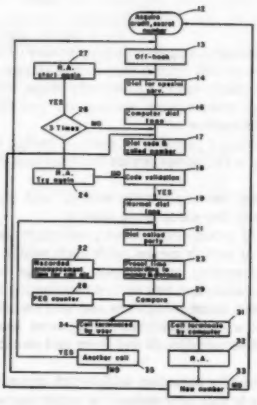
to connect said line circuit output to said speaker amplifier input and to connect said microphone amplifier output to said line circuit input while inhibiting transmission of audio signals from said audio signal output of said control unit receiver means to said input of said line circuit, voice-operated switching means in said control unit associated with said microphone amplifier and operable in said "local answer" mode, said voice-operated switching means being responsive to microphone-generated audio signals of above a certain threshold value and being then operable to inhibit transmission of audio signals through said speaker amplifier to said speaker.

4,706,275

TELEPHONE SYSTEM

Zvi Kamil, Ramat Gan, Israel, assignor to Aerotel Ltd., Ramat Gan, Ill.X

Filed Nov. 13, 1985, Ser. No. 797,658
Int. Cl.[4] H04M *17/02*
U.S. Cl. 379—144 **23 Claims**



1. A unique method for making telephone calls from any available telephone, said method comprising the steps of:

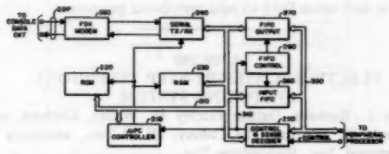
(a) obtaining a special code by depositing a prepayment amount;
(b) storing the prepayment amount in a memory in a special exchange for use in verifying calling party calls;
(c) dialing said special exchange when a telephone call connection is desired;
(d) inputting such special code for verification;
(e) inputting the number of the called party;
(f) verifying the special code and comparing the prepayment amount less any deduction for previous calls in the memory and the minimum cost of the inputted call;
(g) connecting called party to the calling party in response to the verification;
(h) monitoring the prepayment amount less deductions for the running cost of the call; and
(i) disconnecting said call when the prepayment amount has been spent.

4,706,276

ARRANGEMENT FOR TRANSFERRING DATA TO A CENTREX

James B. Black, Phoenix, Ariz., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Dec. 24, 1985, Ser. No. 813,186
Int. Cl.[4] H04M 3/42
U.S. Cl. 379—242 **10 Claims**



1. An operating unit for an interface circuit for transmitting data messages between a remotely located attendant console and a CENTREX equipped central office exchange, said central office exchange including an analog control unit connected to a peripheral processor, said analog control unit including a control field for sending control signals to said interface circuit, and a sense field for receiving control signals from said interface circuit and receiving data messages from said interface circuit, said operating unit comprising:

receiving means connected to said attendant console and to controller means, said receiving means arranged to receive a data message from said attendant console and set a receive signal signaling said controller means that a first byte of said data message has been received;

state machine means called by said controller means arranged to transfer said first byte to temporary memory means and reset said receive signal, said state machine means accepting all additional characters from said receiving means and storing said characters in said memory means until a character sequence is received indicating an end of data message;

analysis means called by said controller means for analyzing said received data message to ascertain the destination of said received data message;

sequential memory means connected to said sense field arranged to receive and store said data message from said memory means responsive to said analysis concluding that said data message is for said peripheral processor; and

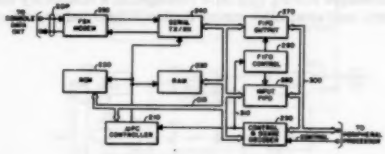
said controller means sends a control signal to said peripheral processor via said sense field indicating a data message has been stored in said sequential memory whereby, said peripheral processor sends said controller means a sequential memory read control signal over said control field indicating that it is reading said sequential memory means and resets said sequential memory read control signal signaling said controller means that the data message has been read.

4,706,277

INTERFACE CIRCUIT FOR TRANSMITTING COMMAND CODES TO AN ATTENDANT CONSOLE

James B. Black, Phoenix, Ariz., assignor to GTE Communications Systems, Phoenix, Ariz.

Filed Dec. 24, 1985, Ser. No. 813,187
Int. Cl.[4] H04M 3/42
U.S. Cl. 379—242 **13 Claims**



1. An interface circuit for transmitting data messages between a CENTREX equipped central office exchange and a remotely located attendant console, said central office exchange including an analog control unit connected to a peripheral processor, said analog control unit including a control field for sending control signals to said interface circuit and a sense field for receiving control signals from said interface circuit and sending data messages to said interface circuit, said interface circuit comprising:

control and sense decoding means connected to said control and sense fields arranged to output control signals to said interface circuit in response to control signals sent over said control field and transfer control signals and data messages over said sense field;

sequential memory means connected to said control and sense decoding means for receiving and storing from said peripheral processor data messages, said sequential memory means further including memory enabling means connected to said control and sense decoding means, and responsive to said peripheral processor sending an enabling signal to said memory enabling means said data messages are written to said sequential memory means;

controller means connected to said sequential memory means and to said control and sense decoding means, and responsive to said peripheral processor signaling said controller means that data messages have been loaded in said sequential memory means said controller means transfers said data messages out of said sequential memory means in the order in which said data messages where input into said sequentially memory means, and said controller means process said received data messages storing said data messages in a temporary memory; and

sending means connected to said attendant console and to said controller means, whereby said controller means transfers said data messages from said temporary memory to said sending means transmitting said data messages to said attendant console.

4,706,278

INTERFACE CIRCUIT FOR TRANSMITTING KEYCODES TO A CENTREX

James B. Black, Phoenix, Ariz., assignor to GTE Communication Systems, Phoenix, Ariz.

Filed Dec. 24, 1985, Ser. No. 813,188
Int. Cl.[4] H04M 3/42
U.S. Cl. 379—242 **14 Claims**

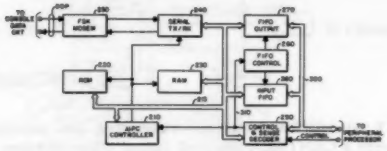
1. An interface circuit for transmitting data messages between a remotely located attendant console and CENTREX equipped central office exchange, said central office exchange including an analog control unit connected to a peripheral

processor, said analog control unit including a control field for sending control signals to said interface circuit and a sense field for receiving control signals and data messages from said interface circuit, said interface circuit comprising:

control and sense decoding means connected to said control and sense fields arranged to output control signals to said interface circuit in response to control commands sent over said control field and output control signals and data messages over said sense field;

receiving means connected to said attendant console arranged to receive data messages from said attendant console;

controller means connected to said receiving means, said controller means arranged to process said received data messages storing said data messages in a temporary memory, said controller means further connected to said control and sense decoding means and arranged to output control signals to said peripheral processor;



sequential memory means connected to said temporary memory for receiving and storing in sequential order as received said data messages, said sequential memory means further including memory enabling means connected to said control and sense decoding means; and

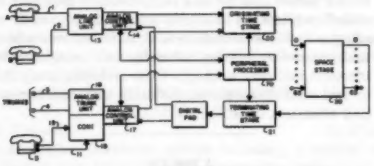
responsive to said controller means signaling said peripheral processor that data messages have been loaded in said sequential memory means, said peripheral processor sends an enabling signal to said memory enabling means whereby, said data messages are read out of said sequential memory means in the order in which said data messages where input into said sequentially memory and output to said peripheral processor via said control and sense decoder means and said sense field.

4,706,279

ARRANGEMENT FOR INITIALIZING A CENTREX CONSOLE INTERFACE CIRCUIT

James B. Black, Phoenix, Ariz., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Dec. 24, 1985, Ser. No. 813,176
Int. Cl.[4] H04M *3/42*
U.S. Cl. 379—279 **10 Claims**



1. An operating unit for initializing an interface circuit connected between a CENTREX equipped central office exchange and an attendant console, the central office exchange including an analog control unit connected to a peripheral processor, said analog control unit including a control field for sending control signals to said interface circuit, and a sense field for receiving control signals from said interface circuit, said operating unit comprising:

controller means connected to memory means and to said control and sense fields said controller means arranged to receive an initialization signal from said peripheral processor over said control field and return an initialization in progress signal to said peripheral processor via said sense field;

memory verification means called by said controller means said memory verification means arranged to ascertain if all locations in said memory means is operable, said controller means arranged to send an error signal to said peripheral processor via said sense field if said memory verifications means detects an error;

interface initialization means called by said controller means, said interface initialization means resetting and clearing a sequential memory means, said sequential memory means connected to said controller means and to said analog control unit, said interface initialization means further resetting and clearing send/receive means connected to said controller means and said attendant console;

transmission verification means called by said controller means, said transmission verification means arranged to ascertain if the transmit and receive loop between said attendant console and said interface circuit is operable, and said controller means arranged to send an error signal to said peripheral processor via said sense field if said transmission verification means detects an error; and

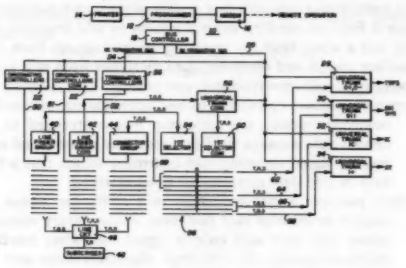
attendant console reset means called by said controller means arranged to send a reset data message to said attendant console via said send/receive means whereby, responsive to a successful reset of said attendant console said controller means sends an initialization complete signal via said sense field to said peripheral processor.

4,706,280

ELECTRONIC STEP-BY-STEP TELEPHONE SWITCHING SYSTEM

Walter L. Barbare, Dallas; Harley M. Willey, Garland, and Ronald D. Higgins, The Colony, all of Tex., assignors to Electrotel, Inc., Richardson, Tex.

Filed Oct. 31, 1985, Ser. No. 793,632
Int. Cl.[4] H04Q *3/24*
U.S. Cl. 379—284 **7 Claims**



1. An electronic step-by-step telephone switch, comprising:

a plurality of line finders connected to a plurality of subscriber lines for detecting an incoming call through said lines,

an originating controller connected to communicate with said line finders and including memory means for storing at least one status condition for each of said lines,

a plurality of selectors responsive to digits received from said line finders for establishing a pathway through said selectors,

a plurality of connectors having said lines provided thereto and connected to said pathway through said selectors for selectively connecting said incoming call to a called party for completing a telephone call,

a plurality of terminating controllers conneected to commu-

nicate with said plurality of connectors, said terminating controllers including memory means for storing at least one status condition for each of said lines,

a plurality of buses for interconnecting said originating controllers and said terminating controllers for transferring status condition information for said lines therebetween, and

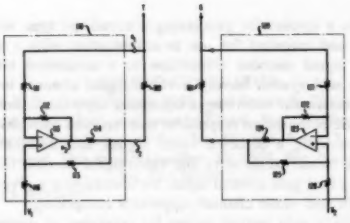
a programmer connected to said plurality of buses for providing office data for storage in said plurality of terminating controller memory means and said originating controller memory means and for receiving line activity information from said origating controller and said plurality of terminating controllers.

4,706,281

DYNAMIC IMPEDANCE ELEMENT FOR A BATTERY FEED CIRCUIT

Richard J. Cubbison, Jr., Littleton, Colo., assignor to American Telephone and Telegraph Company and AT&T Information Systems Inc., Holmdel, N.J.

Filed Apr. 30, 1984, Ser. No. 605,190
Int. Cl.[4] H04M *19/00*
U.S. Cl. 379—322 **7 Claims**



1. An impedance circuit connected between a communication lead (T) and a power source (V_1) for providing a fixed impedance value (Z) between said communication lead (T) and said power source (V_1), comprising:

impedance means (**100**) of nominal impedance R, having a first and a second terminal, said first terminal being connected to said communication lead (T); and

active compensation means (**110**) connected to said first terminal and between said second terminal and said power source (V_1) and responsive to the actual impedance of said impedance circuit as measured between said communication lead (T) and said power source (V_1) for applying a compensation signal to said impedance means (**100**) of magnitude to modify the impedance of said impedance circuit as measured between said communication lead (T) and said power source (V_1) to equal said fixed impedance value (Z) by offsetting any deviation in the impedance of said impedance means (**100**) from said nominal impedance R.

4,706,282

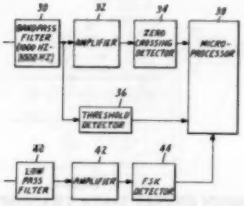
DECODER FOR A RECORDER-DECODER SYSTEM

Michael J. Knowd, Vadnais Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 23, 1985, Ser. No. 812,861
Int. Cl.[4] H04L *9/00*
U.S. Cl. 380—3 **1 Claim**

1. An improved decoder for a recorder-decoder system having a recorder which records an audio input and records a data signal that includes a count of zero crossings of the recorded audio occurring during sequential increments of time with a threshold information bit provided for each count indicating whether a threshold level in the recorder was satisfied by the recorded audio at least once during a count, the decoder for the system providing for playback of the recorded audio and recorded data signal with a count of zero crossings of the recorded audio made during sequential increments of time with the data signal count for an increment of time when the threshold level was indicated as being met being compared with the count obtained by the decoder for the same increment of the recording to provide a measure of whether the recorder audio for such increment was tampered subsequent to its being recorded, the improvement including:

a threshold circuit included in the decoder which is operable during playback of the recorded audio and recorded data signal for detecting whether the recorded audio exceeds the threshold level of said threshold circuit while a zero



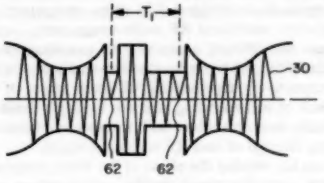
crossing count of the recorded audio is being made, said threshold level being higher than the threshold level of the recorder whereby an additional check for tampering of the recorded audio is provided in that tampering of the recorded audio is considered to have occurred if the threshold information bit for a count of zero crossings in the recorded data indicates the threshold level was not met and the threshold level indication provided by the threshold circuit of the decoder during the playback of the recorded audio of the corresponding increment of the recorded audio signal indicates the threshold level was met.

4,706,283

TELEVISION SIGNAL SCRAMBLING SYSTEM

Richard W. Citta, Oak Park; Dennis M. Mutzabaugh, and Gary J. Sgrignoli, both of Mt. Prospect, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Mar. 15, 1985, Ser. No. 711,947
The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.
Int. Cl.[4] H04N *7/167*
U.S. Cl. 380—12 **33 Claims**



1. A television signal transmission system, comprising:

means for developing an RF television signal including an amplitude modulated RF video component and a frequency modulated RF audio component;

means for defining a plurality of encoding intervals each having a duration substantially time coincident with a respective horizontal blanking interval of said RF television signal;

means for encoding said RF television signal by varying the amplitude and altering the phase of said video component during said encoding intervals according to respective

functions that vary non-linearly with frequency between the carrier frequencies of said video and audio components;

means for transmitting said encoded RF television signal;

means for receiving said transmitted signal;

phase modulation detection means responsive to said received signals for detecting said encoding intervals; and

decoding means responsive to said detected intervals and having amplitude and phase response characteristics comprising the complements of said respect functions for restoring said television signal during said encoding intervals.

4,706,284

TELEVISION SIGNAL DATA TRANSMISSION SYSTEM

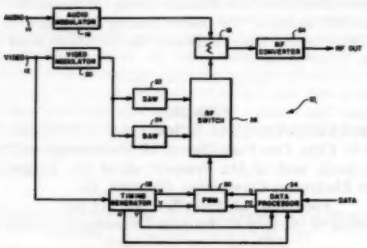
Richard W. Citta, Oak Park; Dennis M. Mutzabaugh, and Gary J. Sgrignoli, both of Mt. Prospect, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Mar. 15, 1985, Ser. No. 712,949

The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.

Int. Cl.[4] H04N 7/167

U.S. Cl. 380—12 **32 Claims**



1. A television signal data transmission system comprising:

means for developing an RF television signal including an amplitude modulated RF video component and a frequency modulated RF audio component;

means for defining a plurality of encoding intervals each characterized by at least a first width or a second width respectively representing different states of a data bit, each of said encoding intervals having a duration substantially time coincident with a respective horizontal blanking interval of said RF television signal;

means for altering the phase of the video component of said RF television signal during said encoding intervals according to as predetermined function that varies non-linearly with frequency between the carrier frequencies of said video and audio components;

means for transmitting said phase altered RF television signal;

means for receiving said transmitted signal;

phase modulation detection means responsive to said received signal for detecting said width modulation encoding intervals; and

pulse width discriminator means responsive to said detected width modulating encoding intervals for deriving said data bits in terms of said different logic states.

4,706,285

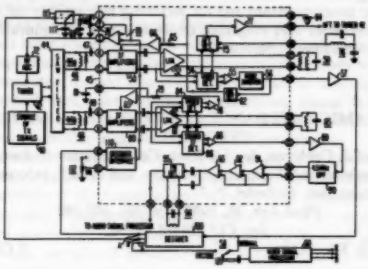
AUTOMATIC GAIN CONTROL OF A SCRAMBLED VIDEO SIGNAL

Mark F. Rumreich, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 24, 1985, Ser. No. 813,135

Int. Cl.[4] H04N 7/167

U.S. Cl. 380—14 **7 Claims**



1. In a system for processing a broadcast type television signal and intended for use in combination with a separate video signal decoder responsive to a scrambled television signal, said system having a video signal channel including input means for receiving a broadcast type television signal, video detector means responsive to a received television signal for providing a detected video signal, and automatic gain control means exclusive of said video signal decoder for developing a first gain control signal for maintaining a given signal gain for said video channel; apparatus comprising:

auxiliary gain control means for receiving an unscrambled video signal derived from a received scrambled television signal; said auxiliary gain control means providing an auxiliary gain control signal with a magnitude related to the magnitude of a component of said unscrambled video signal; and

means for coupling said auxiliary gain control signal to said automatic gain control means to augment said first gain control signal for maintaining a desired signal gain for said video channel in the presence of a received scrambled television signal.

4,706,286

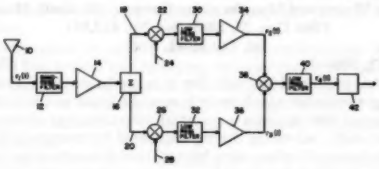
METHOD AND CIRCUIT FOR EXTRACTION OF DOPPLER INFORMATION FROM A PSEUDO-NOISE MODULATED CARRIER

Mark A. Sturza, Woodland Hills, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Continuation of Ser. No. 567,338, Dec. 30, 1983. This application May 30, 1986, Ser. No. 869,823

Int. Cl.[4] H04L 9/00

U.S. Cl. 380—34 **7 Claims**



1. A method for extracting the Doppler frequency and phase from a direct sequence spread spectrum signal of the type that

include a sinusoidal carrier modulated by a psuedo-noise sequence, said method comprising the steps of:

(a) splitting said signal equally into first and second signals; then

(b) mixing said first signal with a first local oscillator to provide a first heterodyned signal, the frequency of said first local oscillator being less than the frequency of said carrier signal; and

(c) mixing said second signal with a second local oscillator to provide a second heterodyned signal, the frequency of said second local oscillator exceeding the frequency of said carrier signal by twice the maximum Doppler frequency shift; then

(d) filtering the sum signals from said first and second heterodyned signals to provide a first difference signal and a second difference signal; then

(e) mixing said first and second difference signals to provide a heterodyned output signal; then

(f) filtering the sum signal from said heterodyned output signal.

4,706,287

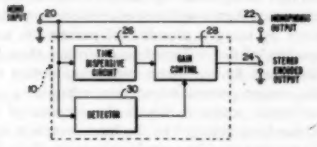
STEREO GENERATOR

David E. Blackmer, Wilton, N.H., and James H. Townsend, Jr., Cambridge, Mass., assignors to Kintek, Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 661,658, Nov. 17, 1984, abandoned. This application Dec. 10, 1984, Ser. No. 679,881

Int. Cl.[4] H04S *5/00*

U.S. Cl. 351—17 **21 Claims**



1. A system for generating a sterophonic information-encoded signal in response to at least a portion of the program information of a monophonic input signal so that said encoded signal can be used with a monophonic signal derived from said monophonic input signal to produce stereophonic sound, said system comprising:

input means receiving said monophonic input signal;

output means providing said stereophonic information-encoded signal; and

means, coupled between said input and output means, for generating said stereophonic information-encoded signal as a function of phase shifts created in said monophonic input signal and in response to and as a function of at least a portion of the program information of said monophonic input signal so as to control the degree of sterephonic spread when said stereophonic sound is produced, said means for generating said stereophonic information-encoded signal includes means for shifting the phase of said monophonic input signal as a function of frequency so as to generate a phase shifted signal, said means for shifting the phase of said monophonic input signal includes a time-dispersive circuit, said time dispersive circuit includes an all-pass phase shifter defining at least twenty bands, of 180° phase shift each, throughout said audio range.

4,706,288

SPEECH SYNTHESIZER OUTPUT DEVICE

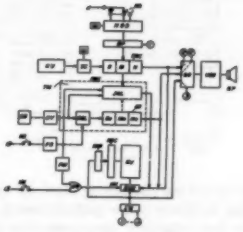
Shintaro Hashimoto, Ikoma; Akitaka Morita, Nara, and Hiroshi Tsuda, Uji, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 236,519, Feb. 20, 1981, abandoned. This application Mar. 10, 1986, Ser. No. 838,871

Claims priority, application Japan, Feb. 22, 1980, 55-21802

Int. Cl.[4] G10L *5/00*

U.S. Cl. 381—51 **3 Claims**



1. A combined timepiece and audible output device comprising:

timekeeping means;

speech synthesizer output means;

first switching means for selecting and setting at least one predetermined time interval for audible announcements by said speech synthesizer output means;

keyboard input means for freely selecting and setting any desired time interval for audible announcements by said speech synthesizer output means;

control circuit means connected to said timekeeping means, speech synthesizer output means, first switching means and keyboard input means;

said control circuit means being automatically responsive to actuation of said first switching means for actuating said speech synthesizer output means to audibly output the time interval set by said first switching means; and

selectively actuable announcement switch means connected to said control circuit means for selectively actuating said speech synthesizer output means to audibly output the time interval set by said first switching means or by said keyboard input means.

4,706,289

LEVEL INDICATING METHODS AND MEANS

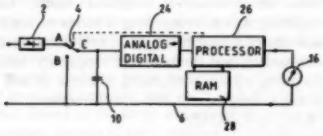
Jorgen S. Jensen, Hjerm, Denmark, assignor to Band & Olufsen A/S, Struer, Denmark

Filed Aug. 28, 1985, Ser. No. 770,266

Claims priority, application Denmark, Aug. 29, 1984, 1505/84

Int. Cl.[4] G01R *19/16*

U.S. Cl. 381—56 **6 Claims**



1. A method of continuously measuring and indicating variations of the intensity of an electric signal, particularly a signal to be recorded by means of a tape recorder, including the step of:

measuring the electric signal at successive measuring periods in such a manner that a measuring result is yielded which represents the maximum value of the signal intensity to

occur during the measuring period, said maximum value being maintained by an associated indicating device during a following hold period, as the intensity signal decreases;

whereby the measuring of the maximum values is carried out in consecutive measuring periods having a duration being an order of size longer than the reaction time of a human eye; and

whereby said hold period has a substantially longer duration by being an order of size longer than the reaction time of a human eye.

4,706,290

METHOD AND APPARATUS EVALUATING AUDITORY DISTORTIONS OF AN AUDIO SYSTEM

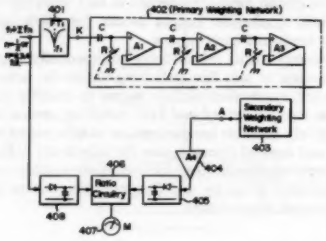
Hong Yue Lin, No. 490, Chung Shan Road, Sec. 2, Chung Ho, Taipei Hsien, Taiwan

Filed Sep. 4, 1985, Ser. No. 772,457

Claims priority, application United Kingdom, Oct. 12, 1984, 8425829

Int. Cl.[4] H04R *29/00*

U.S. Cl. 381—58 **10 Claims**



1. A method for evaluating auditory distortions of an audio system, comprising the steps of:

(a) receiving an input signal containing a fundamental frequency and harmonic components produced by said audio system;

(b) attenuating said fundamental frequency;

(c) weighting said harmonic components first with a primary weighting means and then with a secondary weighting means to produce a weighted signal, said primary weighting means comprising a series of high pass filters each one of which having a −3dB cutoff frequency proportional to said fundamental frequency, said secondary weighting means comprising a series of low pass filters having a composite −3dB cutoff frequency in the range of 2 KHZ to 12 KHZ;

(d) rectifying and filtering said weighted signal by a first rectifier and a first ripple filter to produce a first signal;

(e) rectifying and filtering said input signal by a second rectifier and a second ripple filter to produce a second signal;

(f) comparing the magnitude of said first signal with that of said second signal and displaying the ratio of the magnitudes of said first and second signals.

4,706,291

REVERBERATION IMPARTING DEVICE

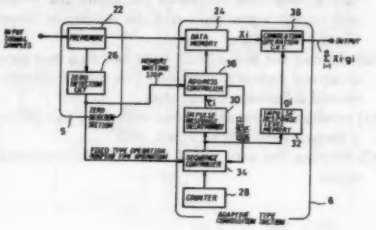
Yuji Kakubo; Koji Niimi, and Yuji Ikegaya, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 23, 1986, Ser. No. 877,442

Claims priority, application Japan, Jun. 25, 1985, 60-138397; Jun. 25, 1985, 60-96523[U]

Int. Cl.[4] H03G *3/00*

U.S. Cl. 381—63 **5 Claims**



1. A reverberation imparting device comprising:

a prememory sequentially storing an input signal;

level detection means responsive to data stored in the prememory for detecting presence or absence of the input signal;

a data memory sequentially storing the input signal delivered out of the prememory after delay of a predetermined time length;

fixed type convolution operation means for producing a reverberation signal with respect to the data stored in the prememory by using an initial portion of parameters of a reflected sound;

adaptive type convolution operations means for producing a reverberation signal with respect to data stored in the data memory by using a plurality of parameters among the parameters of the reflected sound other than the initial portion used by the fixed type convolution operation means, except parameters corresponding to a portion of the reflected sound in which the absence of the input signal has been detected by the level detection means; and

addition means for adding resulting outputs of the fixed type convolution operation means and the adaptive type convolution operation means and delivering out the result of the addition as a reverberation imparted output signal.

4,706,292

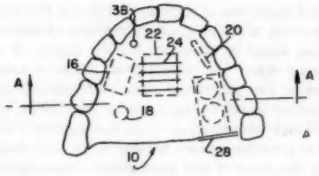
SPEECH PROSTHESIS

W. Lee Torgeson, Pittsburgh, Pa., assignor to Joseph A. Resnick, Natrona Heights, Pa.

Filed Oct. 7, 1985, Ser. No. 785,259

Int. Cl.[4] A61F *1/20*

U.S. Cl. 381—70 **10 Claims**



1. A speech prosthesis comprising a plate, a hornless, direct radiator speaker carried by the plate, and a membrane means

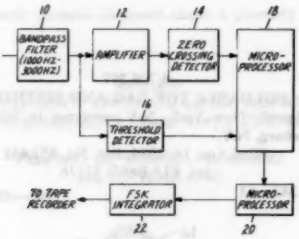
sealed around the plate for protecting the speaker from liquids and food and free centrally to vibrate in response to sound from the speaker, the membrane means increasing the vibrating area of the speaker, for improving low frequency output.

4,706,293

CIRCUITRY FOR CHARACTERIZING SPEECH FOR TAMPER PROTECTED RECORDING

Michael J. Knowd, Vadnais Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 10, 1984, Ser. No. 639,787
Int. Cl.[4] G10L 5/00
U.S. Cl. 381—31 **11 Claims**



1. Circuitry for the production of characterizing information with respect to an audio signal being recorded on a recording media including:

filter means operatively connected for receiving the audio signal and selecting a portion of the audio signal;

a zero crossing detector operatively connected to the output of said filter means for detecting the zero crossings of the audio signal received from said filter means;

a threshold detector connected to the output of said filter for determining when the signal from said filter satisfies the threshold of said threshold detector;

means connected to the output of said threshold detector and said zero crossing detector for producing a count of the zero crossing for consecutive time intervals, as characterizing information, and providing an indication of whether the threshold of said threshold detector was satisfied during each of said consecutive time intervals; and

means connected to said means connected to the output of said threshold circuit and said zero crossing detector for receiving said count for each of the consecutive time intervals and said indication for each of the consecutive time intervals and converting said counts and indications into data signals which can be recorded with the audio signal on the recording media.

4,706,294

AUDIO CONTROL DEVICE

Kenji Ouchida, Iwaka, Japan, assignor to Alpine Electronics Inc., Japan

Filed Jun. 10, 1986, Ser. No. 872,674
Claims priority, application Japan, Jun. 11, 1985, 60-86979[U]
Int. Cl.[4] H03G 3/00
U.S. Cl. 381—109 **3 Claims**

1. An audio control device comprising:

a level display for displaying a level set for a selected mode of a plurality of modes;

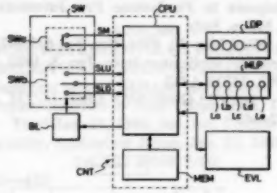
a switching portion for generating a mode selection signal for selection of a respective mode of the plurality of modes, and for generating a level signal indicating a level to be set by rotation of a switch element of said switching portion in a predetermined angle of rotation;

an electronic regulator for generating a value corresponding to said level to be set for a selected mode by said switching portion;

a memory for storing and recalling said generated value representing a level set for a selected mode;

a brake mechanism for braking the rotation of said switch element when predetermined upper and lower level limits of said value for a selected mode are reached; and

a control portion for changing to a selected mode each time the mode selection signal is generated, controlling said



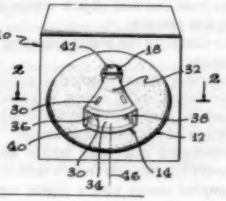
display to display the level previously set for the selected mode from the corresponding value stored in said memory, controlling said electronic regulator and changing the value stored in said memory for the selected mode corresponding to a level signal indicating a level currently set by rotation of said switch element, and operating said braking mechanism to brake said switch element when a predetermined upper or lower level limit for the selected mode is reached.

4,706,295

COAXIAL LOUDSPEAKER SYSTEM

Milton T. Putnam, and William L. Putnam, both of Tarzana, Calif., assignors to United Recording Electronic Industries, Hollywood, Calif.

Filed Oct. 28, 1980, Ser. No. 201,547
Int. Cl.[4] G10K 13/00
U.S. Cl. 381—156 **2 Claims**



1. In a coaxial loudspeaker system which includes a large loudspeaker for propagating lower frequency sounds, and a small higher frequency horn lying largely within said large loudspeaker for propagating higher frequency sounds, the loudspeaker and horn each having small and large ends and an axis extending between them, and with said axes extending substantially coaxial and horizontal, and wherein said horn has a much greater horizontal width than its vertical height near its large end, the improvement wherein:

said higher frequency horn has a plurality of slots formed therein at locations between the small and large ends of the horn but closer to the large end of the horn, to admit lower frequency sounds initially moving within said large horn but outside said higher frequency horn, into a region bounded by said higher frequency horn;

each of said slots is elongate, has inner and outer end portions respectively closest to the small and to the large ends of the horn, and has a length as measured between said end portions which is at least about twice its width; and

said slots lie at positions spaced from either side of an imaginary verticle center plane passing through the axis of said

horn, but said horn is substantially devoid of slots on said vertical center plane.

4,706,296

MODULARLY EXPANSIBLE SYSTEM FOR REAL TIME PROCESSING OF A TV DISPLAY, USEFUL IN PARTICULAR FOR THE ACQUISITION OF COORDINATES OF KNOWN SHAPE OBJECTS

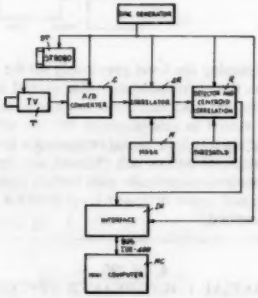
Antonio Pedotti, Brenta, and Giancarlo Ferrigno, Milan, both of Italy, assignors to Fondazione Pro Juventute Don Carlo Gnocchi, Milan, Italy

Filed May 30, 1984, Ser. No. 615,442

Claims priority, application Italy, Jun. 3, 1983, 21458 A/83; Nov. 15, 1983, 23733 A/83

Int. Cl.[4] G06K 9/62; G06F 15/336

U.S. Cl. 382—42 2 Claims



1. A television image real-time processing system for in-line acquisition of the coordinates of a plurality of moving objects of predetermined shape, said system comprising in combination and operatively interconnected circuit-wise:

(a) television camera means adapted for scanning a field wherein at least one said object whose coordinates are to be acquired is present;

(b) means for sampling the image recorded by said television camera means;

(c) clock generator means adapted to synchronize operation of said television camera means, to generate timing for the system and to generate coordinate signals defining selected portion of the television image;

(d) analog-to-digital converter means adapted to sequentially convert information from a selected shifting portion of the sampled image into a digital signal, said shifting portion being selected in response to said coordinate signals from said clock generator means and comprising the intersection of a predetermined small number of columns with a predetermined small number of rows of the raster of the television image;

(e) settable reference generating means to generate a digital reference weighing signal representative of a said object;

(f) correlation means connected to said converter and to said reference generating means to receive and correlate the digital signal from the converter and the digital reference weighing signal from the reference generating means and to supply a correlation signal whose magnitude is indicative of the degree of said correlation;

(g) detector means connected to said correlation means to receive said correlation signal and to detect whether the magnitude of the correlation signal exceeds a preset threshold value thereby to indicate that the presently selected said portion of the sampled image likely represents the present coordinates of a said object in said field; and

(h) minicomputer means connected to said detector for further processing said correlation signals to effect said indication of said coordinates, wherein said correlation means comprises a plurality of cascade connected stages, said stages including:

a first stage comprising row delay lines equal in number to said predetermined small number of rows;

a second stage comprising column delay lines equal in number to said predetermined small number of columns;

a third stage comprising pre-adders;

a fourth stage comprising multipliers connected to receive also said digital reference weighing signals from said reference generating means; and

a fifth stage comprising a totalizing adder stage to provide said correlation signal.

4,706,297

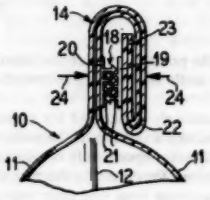
FOLDABLE TOP BAG AND METHOD

Steven Ausnit, New York, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Apr. 16, 1986, Ser. No. 852,641

Int. Cl.[4] B65D 33/16

U.S. Cl. 383—63 9 Claims



1. In a container having a pair of opposed expandably connected walls providing a top opening:

a foldable top provided by upper end portions of said walls and adapted to be folded for closing said top opening;

complementary reclosable extruded plastic fastener strips carried on and extending across the outer faces of said upper wall portions for releasably holding said foldable top in folded condition; and

each of said strips having a plurality of resiliently flexible arrow-shaped profiles, all of which on both strips are essentially identical and project away from the wall portion on which the respective strip is carried so that when said top is folded to orient the fastener strips into opposed relation the profiles of the strips can be interlocked by pressing the folded upper end portions of the bag walls toward one another by pressure directed simultaneously from opposite directions towards said fastener strips.

4,706,298

FUSED PLASTIC BAG CLOSURE AND APPARATUS FOR MAKING SAME

Arnold Lipes, Montreal, and George Soga, Duverway, both of Canada, assignors to Packaging Automation Machinery Co. Ltd., Montreal, Canada

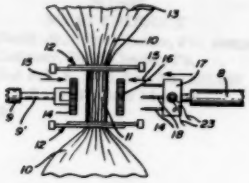
Filed Jul. 25, 1986, Ser. No. 889,211

Int. Cl.[4] B65D 33/16

U.S. Cl. 383—71 12 Claims

9. A plastic bag for retaining a content therein, said bag having a sealed gathered throat portion adjacent and end opening thereof, said sealed gathered throat being formed by

randomly disposed wall portions of plastic material fused together by two or more rows of spaced apart fused pin seals of



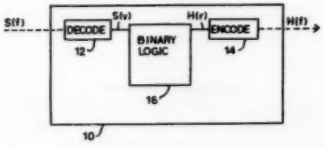
melted plastic material disposed about a plurality of needle holes.

4,706,299

FREQUENCY ENCODED LOGIC DEVICES

Peter O. Jorgensen, 12175 Glacier Hwy., #D3, Juneau, Ak. 99801

Filed May 15, 1984, Ser. No. 610,592
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—608 **15 Claims**



1. In a logic apparatus for performing logic operations on frequency encoded signals, the improvement comprising:

means for decoding and encoding optical input and output signals to and from said apparatus, said signals having three frequency components, said means including

frequency sensing decoding means for sensing the presence or absence of said three frequency components in said input signals and converting said frequency signals to specific electrical binary signals having logic levels indicative of presence or absence of said frequencies;

a binary logic circuit adapted to accept said electrical binary signals from the decoding means, to perform logic operations on said signals, and to provide an output ensemble of electrical binary signals; and

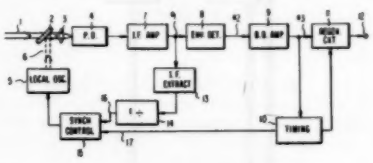
frequency selecting encoding means for converting said ensemble of electrical binary signals to output optical signals having said three frequency components whereby there is encoded logic levels of specified ones of said individual binary signals as presence or absence of said frequency components.

4,706,300

OPTICAL HETERODYNE DETECTION PULSE RECEIVING SYSTEM AND METHOD

Kouichi Minemura; Minoru Shikada, and Katsumi Emura, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 31, 1984, Ser. No. 575,595
Claims priority, application Japan, Jan. 31, 1983, 58-14201
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—619 **12 Claims**



1. An optical heterodyne detection pulse receiving method comprising the steps of:

mixing an optical carrier modulated with a pulse signal and a local oscillator light wave having a frequency different from said carrier, and producing an electrical signal having an intermediate frequency equal to the difference between the frequency of said local oscillator light wave and that of said optical carrier;

extracting the timing signal of said pulse signal from said electrical signal;

generating a reproduction of said pulse signal by demodulating said electrical signal; and

controlling the frequency of said local oscillator light wave so as to synchronize a first signal, derived from said electrical signal and having a period which is an integer multiple of the half period of said electrical signal, with a second signal derived from said timing signal and having a period equal to that of said pulse signal.

[illegible]

[illegible]

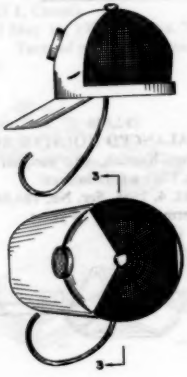
[illegible]

DESIGNS

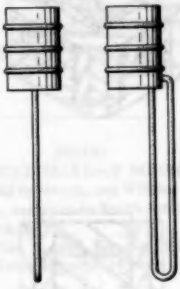
NOVEMBER 10, 1987

292,640
MEAT PRODUCT
Eugene D. Gagliardi, Jr., West Chester, Pa., assignor to Southdown Meat Company, West Chester, Pa.
Filed Feb. 8, 1985, Ser. No. 699,609
Term of patent 14 years
U.S. Cl. D1—199

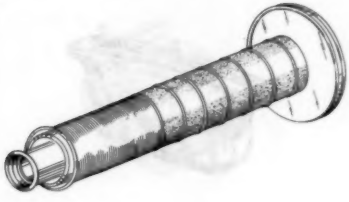
292,641
CAP FOR BUBBLE BLOWING
Steve Jernander, 1521 Frederick St., Santa Rosa, Calif. 95401, and Ardith A. Clubb, P.O. Box 6012, Santa Rosa, Calif. 95406
Filed May 13, 1985, Ser. No. 713,781
Term of patent 14 years
U.S. Cl. D2—244



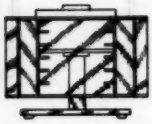
292,642
UMBRELLA HANDLE
Julie A. Selig, Cincinnati, Ohio, assignor to 'totes', incorporated
Filed Oct. 18, 1985, Ser. No. 788,959
Term of patent 14 years
U.S. Cl. D3—12



292,643
YARN BOBBIN
H. Wayne Dick, and John B. Shoemaker, both of Lexington, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Feb. 14, 1985, Ser. No. 701,847
Term of patent 14 years
U.S. Cl. D3—24



292,644
CASSETTE TAPE STORAGE CABINET
Nathaniel Hall, and Grace R. Hall, both of 618 Hedgeleaf Ave., Capitol Heights, Md. 20743
Filed Dec. 27, 1985, Ser. No. 814,057
Term of patent 14 years
U.S. Cl. D3—35



292,645
BAG
Raymond W. Young, West Bend, Wis., assignor to Amity Leather Products, West Bend, Wis.
Filed Apr. 11, 1985, Ser. No. 722,718
Term of patent 14 years
U.S. Cl. D3—39

292,646
MULTIPLE POUCH TOTE BAG
Paul Pitini, II, and Jeanne Albitz-Pitini, both of 13277 Lakeview Granada Dr., Lakeside, Calif. 92040
Filed Mar. 4, 1985, Ser. No. 707,889
Term of patent 14 years
U.S. Cl. D3—48

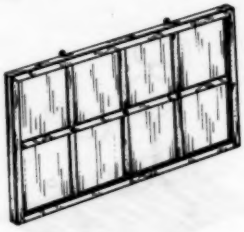
292,647
COMBINED REAR HOLSTER AND BELT
Robert W. Remington, Kamiah, Id., assignor to Claude R. Wimer, Jr., Naples, Fla., a part interest
Filed Oct. 4, 1985, Ser. No. 784,494
Term of patent 14 years
U.S. Cl. D3—101

292,648
COMBINED BALANCED HOLSTER AND BELT
Robert W. Remington, Kamiah, Id., assignor to Claude R. Wimer, Jr., Naples, Fla., a part interest
Filed Oct. 4, 1985, Ser. No. 784,495
Term of patent 14 years
U.S. Cl. D3—101

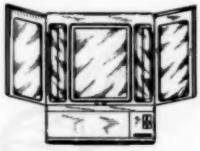
292,649
PAINT BRUSH HAVING A MANUALLY OPERATED HANDLE PUMP CONNECTED BY TUBING TO A PAINT CONTAINER
Thomas W. Engleman, R.R. 1, Raymond, Ill. 62560
Filed Mar. 23, 1984, Ser. No. 592,871
Term of patent 14 years
U.S. Cl. D4—114

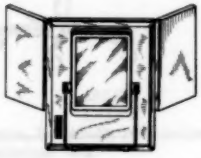
292,650
COMBINATION LINT REMOVER AND SHOE POLISHER
Bertram Schmitz, 55 Harbour Square, Suite 1214, Toronto, Ontario M5J 2L1, Canada
Filed May 14, 1985, Ser. No. 733,924
Term of patent 14 years
U.S. Cl. D4—137

292,651
MULTI-PICTURE DISPLAY FRAME
Kent E. Stratton, 2200 E. Bay Dr., Daphne, Ala. 36526
Filed Mar. 27, 1985, Ser. No. 716,463
Term of patent 14 years
U.S. Cl. D6—301



292,652
LIGHTED MAKE-UP MIRROR
Ronald L. Muller, Old Saybrook, and William J. Rakocy, Madison, both of Conn., assignors to North American Philips Corporation, New York, N.Y.
Filed Mar. 7, 1985, Ser. No. 709,164
Term of patent 14 years
U.S. Cl. D6—308



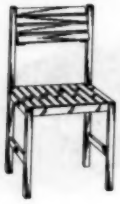


292,653
PORTABLE INFANT RESTRAINT
Ronald L. Church, and Laurene J. Church, both of 2000 W. Catalpa, Anaheim, Calif. 92801
Filed May 20, 1985, Ser. No. 736,110
Term of patent 14 years
U.S. Cl. D6—333

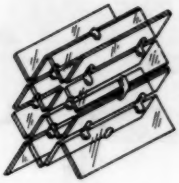
292,654
COMBINED CHAIR AND KNEE REST
Gregory M. Melvin, San Diego, Calif., assignor to Counterstress Products, Inc., San Diego, Calif.
Filed Jul. 30, 1984, Ser. No. 635,793
Term of patent 14 years
U.S. Cl. D6—360

292,655
SWIVEL CHAIR
William B. Hendrick, Grand Rapids, Mich., assignor to Mueller Furniture Corporation, Grand Rapids, Mich.
Filed Apr. 5, 1985, Ser. No. 720,624
Term of patent 14 years
U.S. Cl. D6—366

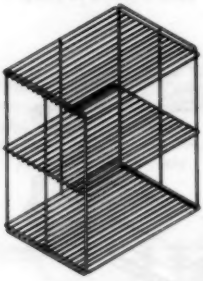
292,656
CHAIR
Don A. Masterton, Mangrove Gardens, St. Philip, Barbados
Filed Jun. 3, 1985, Ser. No. 740,886
Term of patent 14 years
U.S. Cl. D6—370



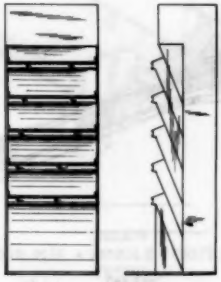
292,657
WINE RACK
Paul D. Wightman, 2348 Bryan Ave., Salt Lake City, Utah 84108
Filed Sep. 17, 1984, Ser. No. 651,459
Term of patent 14 years
U.S. Cl. D6—462



292,658
MODULAR DISPLAY RACK
Melvin E. Kester, Concord, N.C., assignor to Fieldcrest Cannon, Inc., Eden, N.C.
Filed Aug. 30, 1984, Ser. No. 646,357
Term of patent 14 years
U.S. Cl. D6—465



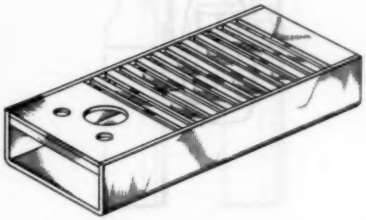
292,659
DISPLAY MODULE FOR BOOKLETS AND THE LIKE
John Svezia, Millburn, N.J., and Robert N. Maronas, Ossining, N.Y., assignors to M. Grumbacher, Inc., New York, N.Y.
Filed Sep. 21, 1984, Ser. No. 652,900
Term of patent 14 years
U.S. Cl. D6—468



292,660
PADDED BICYCLE SEAT COVER
Rona M. Levin, 8436 N. Kimball, Skokie, Ill. 60076
Filed Feb. 25, 1985, Ser. No. 704,663
Term of patent 14 years
U.S. Cl. D6—502

292,661
FOOD TRAY
Edward H. Lacey, P.O. Box 796, Trent, S. Dak. 57065
Filed Feb. 25, 1985, Ser. No. 704,748
Term of patent 14 years
U.S. Cl. D7—38

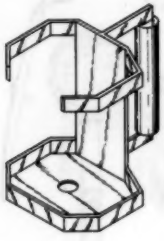
292,662
COMBINATION FOOD PROCESSOR DISC BLADE AND ACCESSORY HOLDER
Jerome B. Alberts, 2109 San Ysidro Dr., Beverly Hills, Calif. 90210
Filed Mar. 25, 1985, Ser. No. 715,721
Term of patent 14 years
U.S. Cl. D7—74



292,663
LADLE
Stanley A. Johnson, Brookfield, Wis., assignor to The Vollrath Company, Sheboygan, Wis.
Filed Mar. 18, 1985, Ser. No. 712,868
Term of patent 14 years
U.S. Cl. D7—104

292,664
INSULATED JUG OR THE LIKE
Anso Zimmermann, Bad Hersfeld, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Niederaula, Fed. Rep. of Germany
Filed Mar. 20, 1985, Ser. No. 714,001
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1984, AR153/84
Term of patent 14 years
U.S. Cl. D7—317

292,665
OIL FILTER REMOVER
Robert E. Heavner, Rte. 1, Box 235, Smithville, Mo. 64089
Filed Jan. 18, 1985, Ser. No. 692,519
Term of patent 14 years
U.S. Cl. D8—14



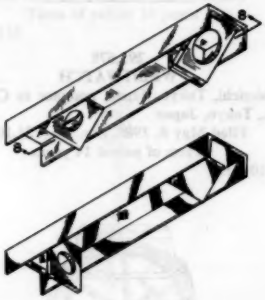
292,666
ADJUSTABLE SPANNER WRENCH
Erik C. Jansson; Bengt B. Brunosson, and Jan-Erik Johansson, all of Enköping, Sweden, assignors to Aktiebolaget Bahco Verktyg, Enkoping, Sweden
Filed May 2, 1984, Ser. No. 606,224
Claims priority, application Sweden, Nov. 2, 1983, 83-2859
Term of patent 14 years
U.S. Cl. D8—22

292,667
LOCKING PIN
Harold N. Simpson, 10 Paul VI, Chateauguay, Quebec, Canada (J6K 2A6)
Filed Mar. 13, 1985, Ser. No. 711,109
Claims priority, application Canada, Sep. 14, 1984, 14-09-84-1
Term of patent 14 years
U.S. Cl. D8—330

292,668
ROPE FASTENER
Lawrence L. Lee, 3776 Martha St., San Diego, Calif. 92117
Filed May 2, 1985, Ser. No. 729,538
Term of patent 14 years
U.S. Cl. D8—356

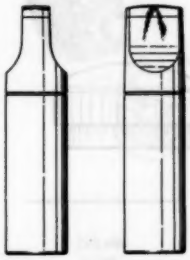
292,669
BANDAGE ROLLER
Kenneth A. Fomby, Gainesville, Tex., assignor to K & D Plastics, Inc., Gainesville, Tex.
Filed Apr. 1, 1985, Ser. No. 718,737
Term of patent 14 years
U.S. Cl. D8—359

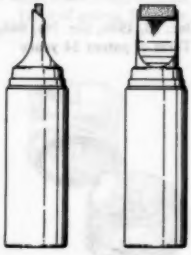
292,670
CONNECTOR FOR A SINGLE STRUT MINE ROOF TRUSS
Ben L. Seegmiller, 3500 Loren Von Dr., Salt Lake City, Utah 84124
Filed Jan. 28, 1985, Ser. No. 695,785
Term of patent 14 years
U.S. Cl. D8—382



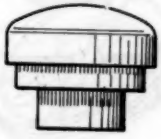
292,671
FRAME CORNER JOINT
Jimmy Björkman, Blidsberg, Sweden, assignor to Tage Björkman & Son AB, Blidsberg, Sweden
Filed Dec. 20, 1984, Ser. No. 684,100
Claims priority, application Sweden, Jun. 19, 1984, 84-1827
Term of patent 14 years
U.S. Cl. D8—382

292,672
COMBINED CONTAINER AND APPLICATOR FOR LIQUID SHOE POLISH OR SIMILAR ARTICLE
Graham Duell, Bentleigh, Australia, assignor to Nicholas Kiwi (Pacific) Pty. Limited, Victoria, Australia
Filed Jun. 18, 1985, Ser. No. 746,088
Claims priority, application United Kingdom, Dec. 21, 1984, 1024082; Dec. 21, 1984, 1024083
Term of patent 14 years
U.S. Cl. D9—338

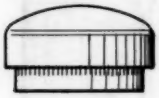




292,673
CAP FOR A CONTAINER
Keith Woodruff, Mountainside, and Edward Morris, Paramus, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.
Filed Jan. 30, 1984, Ser. No. 575,252
The portion of the term of this patent subsequent to Nov. 5, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—439



292,674
CAP FOR A CONTAINER
Edward Morris, Paramus, and Keith Woodruff, Mountainside, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.
Filed Jan. 30, 1984, Ser. No. 575,093
The portion of the term of this patent subsequent to Nov. 5, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—439



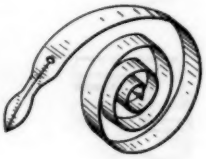
292,675
BOTTLE PUMP CAP
David J. Landecker, 112 W. Mission St., Santa Barbara, Calif. 93101
Filed Dec. 23, 1986, Ser. No. 946,278
Term of patent 14 years
U.S. Cl. D9—449

292,676
CUP LID
Sal Mileto, 2401 "I" Ave., Lawton, Okla. 72505
Filed Jul. 17, 1984, Ser. No. 631,727
Term of patent 14 years
U.S. Cl. D9—454

292,677
ATTACHABLE WATCH
Urs M. Jordi, Crans-Pres-Celigny, Switzerland, assignor to Altop S.A., Geneva, Switzerland
Filed Sep. 16, 1986, Ser. No. 908,110
Claims priority, application World Int. Prop. O., Mar. 25, 1986, DMA000485
Term of patent 14 years
U.S. Cl. D10—31

292,678
WRISTWATCH
Takashi Takeichi, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed May 6, 1985, Ser. No. 731,101
Term of patent 14 years
U.S. Cl. D10—39

292,679
COMBINED LIE LEVEL AND ATTACHMENT STRAP
Fred T. Fincher, 508 Lincoln St., LaGrange, Ga. 30240
Filed Feb. 11, 1985, Ser. No. 700,651
Term of patent 14 years
U.S. Cl. D10—69



292,680
THERMOMETER
Raymond Chan, Hong Kong, Hong Kong, assignor to Integrated Display Technology Limited, Hung Hom, Hong Kong
Filed May 3, 1985, Ser. No. 730,773
Claims priority, application United Kingdom, Nov. 8, 1984, 1023199
Term of patent 14 years
U.S. Cl. D10—57

292,681
MOBILE TRAFFIC SIGNAL
James A. Evans, 415 Saginaw Ave., Calumet City, Ill. 60409
Filed Feb. 19, 1985, Ser. No. 702,495
Term of patent 14 years
U.S. Cl. D10—115

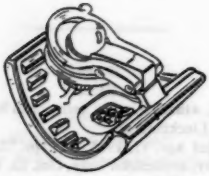
292,682
RING
Marina Bulgari, Athens, Greece, assignor to Marina B Creation S.A., Vaduz, Liechtenstein
Filed May 1, 1985, Ser. No. 729,554
Claims priority, application Italy, Nov. 13, 1984, 36232/84[U]
Term of patent 14 years
U.S. Cl. D11—27

292,683
RING
Marina Bulgari, Athens, Greece, assignor to Marina B Creation S.A., Vaduz, Liechtenstein
Filed Apr. 11, 1985, Ser. No. 722,055
Claims priority, application Italy, Oct. 12, 1984, 36145/84[U]
Term of patent 14 years
U.S. Cl. D11—34

292,684
RING
Marina Bulgari, Athens, Greece, assignor to Marina B. Creation S.A., Vaduz, Liechtenstein
Filed Apr. 11, 1985, Ser. No. 722,056
Claims priority, application Italy, Oct. 12, 1984, 36144/84[U]
Term of patent 14 years
U.S. Cl. D11—34

292,685
EARRING
Marina Bulgari, Athens, Greece, assignor to Marina B Creation S.A., Liechtenstein
Filed Jun. 6, 1985, Ser. No. 742,026
Claims priority, application Italy, Feb. 27, 1985, 35647/85[U]
Term of patent 14 years
U.S. Cl. D11—40

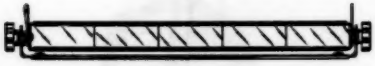
292,686
EARRING
Marina Bulgari, Athens, Greece, assignor to Marina B. Creation S. A. Vaduz, Liechtenstein
Filed Apr. 11, 1985, Ser. No. 722,000
Claims priority, application Italy, Oct. 12, 1984, 36146/784[U]
Term of patent 14 years
U.S. Cl. D11—40



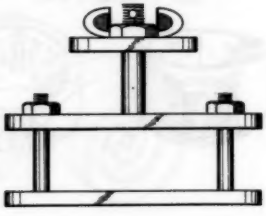
292,687
HOOK FOR AN EARRING
Ari P. Pesonen, Heinävesi, SF-79895 Sarvikumpu, Italy
Filed Apr. 23, 1985, Ser. No. 726,055
Term of patent 14 years
U.S. Cl. D11—88

292,688
BICYCLE TIRE
Eiji Fukuchi, Kagawa, Japan, assignor to Mitsuboshi Belting Ltd., Hyogo, Japan
Filed Jan. 24, 1985, Ser. No. 695,670
Term of patent 14 years
U.S. Cl. D12—147

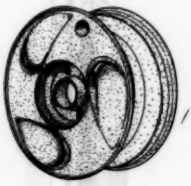
292,689
COMBINED MULTI-SECTION REAR VIEW MIRROR AND ANTI-GLARE VISOR
Raymond P. Espinoza, 15116 Arlette Dr., Victorville, Calif. 92392, and Patrick R. Wooten, 7659 Tamarind Ave., Fontana, Calif. 92335
Filed Nov. 21, 1985, Ser. No. 805,998
Term of patent 14 years
U.S. Cl. D12—188



292,690
SPARE TIRE MOUNTING BRACKET
Ken M. Knutson, 2906 De Schepper Dr., Grand Rapids, Minn. 55744
Filed Feb. 21, 1985, Ser. No. 704,044
Term of patent 14 years
U.S. Cl. D12—202

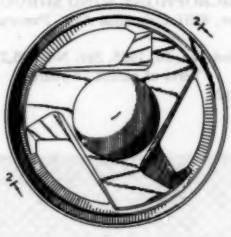


292,691
WHEEL
Björn E. A. Envall, Vänersborg, Sweden, assignor to Saab-Scania Aktiebolag, Trollhattan, Sweden
Filed Sep. 23, 1985, Ser. No. 778,720
Claims priority, application Sweden, Mar. 21, 1985, 85-0731
Term of patent 14 years
U.S. Cl. D12—206

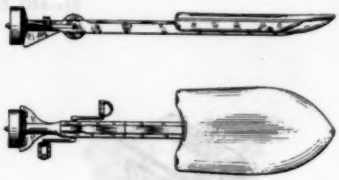


292,692
WHEEL
Richard W. Smith, Lansing, and William A. Lee, Battle Creek, both of Mich., assignors to Motor Wheel Corporation, Lansing, Mich.
Filed Sep. 30, 1985, Ser. No. 782,111
Term of patent 14 years
U.S. Cl. D12—211

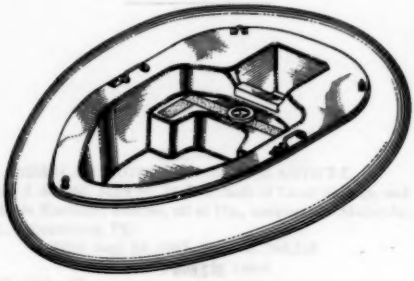
292,693
VEHICLE WHEEL
Marco Cattaneo, Pavia, Italy, assignor to MOMO S.p.A., Milan, Italy
Filed Jul. 8, 1985, Ser. No. 752,717
Term of patent 14 years
U.S. Cl. D12—211



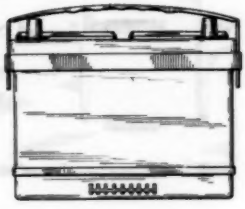
292,694
WATERCRAFT
Neil A. Panyik, Rte. 1, Box 632, Lucas, Ohio 44843
Filed Mar. 11, 1985, Ser. No. 710,566
Term of patent 14 years
U.S. Cl. D12—306



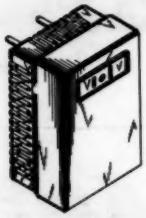
292,695
WATERCRAFT
Voogd Marten, 18141 Beach Blvd., Suite 370, Huntington Beach, Calif. 92648
Filed Dec. 27, 1985, Ser. No. 813,943
The portion of the term of this patent subsequent to Nov. 3, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—316



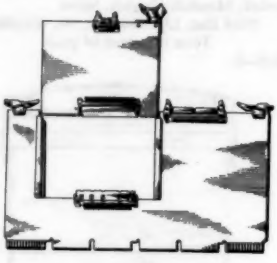
292,696
COMBINED BATTERY AND DETACHABLE HANDLE
Richard M. Sahli, Cottage Grove, Minn., assignor to GNB Incorporated, Mendota Heights, Minn.
Filed Dec. 13, 1984, Ser. No. 681,406
Term of patent 14 years
U.S. Cl. D13—8



292,697
VOLTAGE CONVERTER
Howard L. Rauch, Old Saybrook, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Dec. 18, 1984, Ser. No. 682,967
Term of patent 14 years
U.S. Cl. D13—11



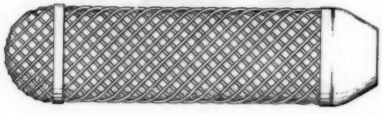
292,698
CIRCUIT BOARD
Joseph P. DeVita, Laguna Hills, and Thomas J. Mulder, San Juan Capistrano, both of Calif., assignors to ABLE Computer, Costa Mesa, Calif.
Filed May 13, 1983, Ser. No. 494,511
Term of patent 14 years
U.S. Cl. D13—12



292,699
DUAL MALE PIN CONNECTOR
Peter S. Vinal, Cary, N.C., assignor to Northern Telecom Limited, Montreal, Canada
Filed Oct. 19, 1984, Ser. No. 662,828
Term of patent 14 years
U.S. Cl. D13—24

292,700
ADAPTER PLUG
Howard L. Rauch, Old Saybrook, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Dec. 18, 1984, Ser. No. 682,966
Term of patent 14 years
U.S. Cl. D13—28

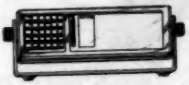
292,701
MICROPHONE WIND SHROUD
Leslie C. Drever, 8251 Columbus Ave., Panorama City, Calif. 91402
Filed Jan. 28, 1985, Ser. No. 695,271
Term of patent 14 years
U.S. Cl. D14—12

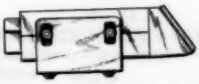


292,702
SPEAKER
Jeffrey N. White, Stow, and Kenneth R. Reichel, Hudson, both of Ohio, assignors to Audio Technica U.S., Inc., Stow, Ohio
Filed Nov. 15, 1984, Ser. No. 671,589
Term of patent 14 years
U.S. Cl. D14—33

292,703
TELEPHONE SET
Joerg Tragatschnig, Zell am See-Thumersbach, Austria, assignor to Ferdinand Alexander Porsche, Stuttgart, Fed. Rep. of Germany
Filed Mar. 18, 1986, Ser. No. 845,078
Claims priority, application World Int. Prop. O., Dec. 27, 1985, DMA/000457
Term of patent 14 years
U.S. Cl. D14—53

292,704
MARINE TRANSCEIVER
Kazuyoshi Imazeki, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan
Filed Oct. 23, 1984, Ser. No. 664,061
The portion of the term of this patent subsequent to Oct. 6, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—68



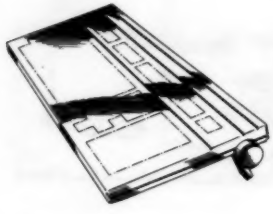


292,705
DISPLAY PAGER OR SIMILAR ARTICLE
William J. Scheid; John M. McKee, both of Coral Springs, and Roberto Kurcbart, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 16, 1985, Ser. No. 766,310
Term of patent 14 years
U.S. Cl. D14—68

292,706
WIRELESS HAND-HELD COMMUNICATIONS TERMINAL
Roy K. Fischer, Paradise Valley, Ariz., assignor to Validec, Inc., San Carlos, Calif.
Filed May 6, 1985, Ser. No. 730,426
Term of patent 14 years
U.S. Cl. D14—68

292,707
UNIVERSAL ANTENNA MOUNT
Lawrence T. Fahy, 4857 Gransback St., Philadelphia, Pa. 19120
Filed Oct. 2, 1985, Ser. No. 782,873
Term of patent 14 years
U.S. Cl. D14—91

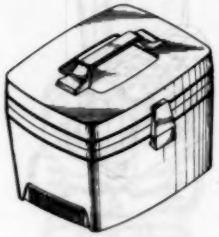
292,708
KEYBOARD
Michel D. Arney, Lowell, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.
Filed Nov. 27, 1985, Ser. No. 807,053
Term of patent 14 years
U.S. Cl. D14—100



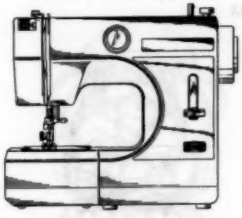
292,709
INPUT/OUTPUT COMPUTER TERMINAL
Mikio Kosako, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Feb. 21, 1985, Ser. No. 703,877
Claims priority, application Japan, Aug. 21, 1984, 59-35041
Term of patent 14 years
U.S. Cl. D14—100

292,710
COMPUTERIZED CHECKBOOK REGISTER
Charles H. Woods, Jr., 2928 W. 138th St., Gardena, Calif. 90249
Filed Oct. 22, 1984, Ser. No. 663,188
Term of patent 14 years
U.S. Cl. D14—100

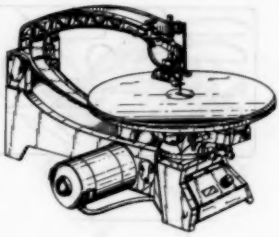
292,711
PORTABLE REFRIGERATOR
Mervyn H. Shapiro, 18100 Burbank Blvd., Apt. 13A, Tarzana, Calif. 91356; Vera Brown, 1109 San Ysidro, Beverly Hills, Calif. 90212, and Yoram Fishman, 3300 Wonderview, Los Angeles, Calif. 90068
Filed May 13, 1985, Ser. No. 734,334
Term of patent 14 years
U.S. Cl. D15—83



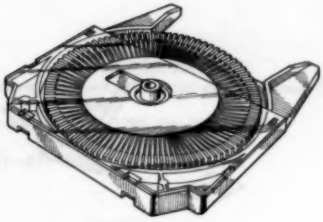
292,712
SEWING MACHINE
Tetsuya Aono, Osaka, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Osaka, Japan
Division of Ser. No. 686,584, Dec. 26, 1984. This application Sep. 25, 1986, Ser. No. 911,435
Claims priority, application Japan, Jul. 3, 1984, 59-027602; Jul. 3, 1984, 59-027603
Term of patent 14 years
U.S. Cl. D15—70



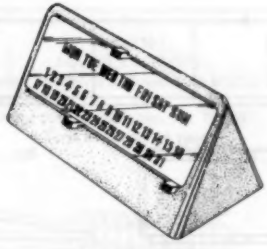
292,713
SCROLL SAW
David Miller, Tupelo, Miss., assignor to Delta International Machinery Corp., Pittsburgh, Pa.
Filed Jun. 10, 1985, Ser. No. 742,936
Term of patent 14 years
U.S. Cl. D15—133



292,714
TYPE CARTRIDGE FOR PRINTER
Setsuo Yajima, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Sep. 25, 1984, Ser. No. 654,258
Claims priority, application Japan, Mar. 26, 1984, 59-11705
Term of patent 14 years
U.S. Cl. D18—22



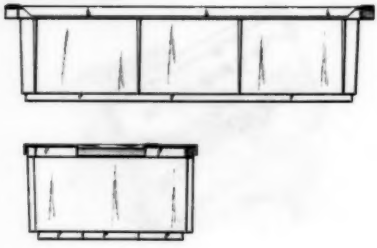
292,715
DESK CALENDAR
Michael A. Hill, Kowloon, Hong Kong, assignor to Hill Products Limited, Kowloon, Hong Kong
Filed Mar. 26, 1985, Ser. No. 716,056
Claims priority, application United Kingdom, Sep. 28, 1984, 1022331
Term of patent 14 years
U.S. Cl. D19—25



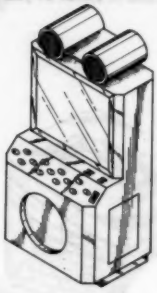
292,716
AERONAUTICAL TEMPLATE
Wayne F. Hallgren, Quarters 4511G, USAFA, Colo. 80840
Filed Apr. 5, 1985, Ser. No. 720,372
Term of patent 14 years
U.S. Cl. D19—37

292,717
DESK ACCESSORY
William O. Murtagh, Toledo, Ohio, assignor to Gerity Products, Inc., Toledo, Ohio
Filed Feb. 19, 1985, Ser. No. 702,589
Term of patent 14 years
U.S. Cl. D19—84

292,718
DOCUMENT BOX
Eric D. Stein, Cincinnati, Ohio, assignor to Buckhorn Material Handling Group Inc., Milford, Ohio
Filed Sep. 19, 1983, Ser. No. 533,590
Term of patent 14 years
U.S. Cl. D19—92



292,719
COMBINED AUDIO AND VIDEO VENDING MACHINE
Jorge A. Maass, 3117 Royal Gable Dr., Dallas, Tex. 75229
Filed Mar. 19, 1985, Ser. No. 713,747
Term of patent 14 years
U.S. Cl. D20—1



292,720
TOY FIGURE
Bonnie Zacherle, Norwood, Mass., assignor to Kenner Parker Toys Inc., Beverly, Mass.
Filed Jun. 26, 1985, Ser. No. 748,884
Term of patent 14 years
U.S. Cl. D21—161

292,721
TOY FIGURE
Bonnie Zacherle, Norwood, Mass., assignor to Kenner Parker Toys Inc., Beverly, Mass.
Filed Jun. 26, 1985, Ser. No. 748,894
Term of patent 14 years
U.S. Cl. D21—163

292,722
TOY FIGURE
Bonnie Zacherle, Norwood, Mass., assignor to Kenner Parker Toys Inc., Beverly, Mass.
Filed Jun. 26, 1985, Ser. No. 748,892
Term of patent 14 years
U.S. Cl. D21—171

292,723
TOY FIGURE
Bonnie Zacherle, Norwood, Mass., assignor to Kenner Parker Toys Inc., Beverly, Mass.
Filed Jun. 26, 1985, Ser. No. 748,799
Term of patent 14 years
U.S. Cl. D21—171

292,724
DOLL
James E. Mitchell, 164 Chestnut St., Bridgewater, N.J. 08807
Filed May 17, 1985, Ser. No. 735,270
Term of patent 14 years
U.S. Cl. D21—174

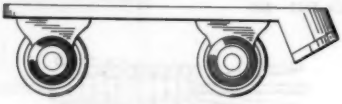
292,725
TOY FIGURE
Bonnie Zacherle, Norwood, Mass., assignor to Kenner Parker Toys Inc., Beverly, Mass.
Filed Jun. 26, 1985, Ser. No. 748,792
Term of patent 14 years
U.S. Cl. D21—177

292,726
MAYFLY NYMPH
William H. Jones, and Doris R. Jones, both of 8721 Elm, Kansas City, Mo. 64138
Filed Jun. 5, 1985, Ser. No. 741,487
Term of patent 14 years
U.S. Cl. D21—185

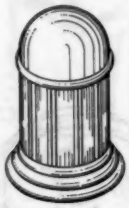
292,727
TOY FIGURE
Bonnie Zacherle, Norwood, Mass., assignor to Kenner Parker Toys Inc., Beverly, Mass.
Filed Jun. 26, 1985, Ser. No. 749,039
Term of patent 14 years
U.S. Cl. D21—187

292,728
EXERCISING DEVICE FOR SIMULATING CLIMBING
William T. Wilkinson, Kemblesville, Pa.
Filed Oct. 4, 1985, Ser. No. 784,531
Term of patent 14 years
U.S. Cl. D21—191

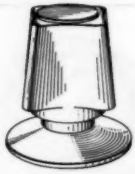
292,729
ROLLER SKATE
Edward E. Ludwig, 40 Drake St., Yarmouthport, Mass. 02675
Filed Feb. 15, 1985, Ser. No. 702,413
Term of patent 14 years
U.S. Cl. D21—226



292,730
FAUCET HANDLE
Serge Belaiche, Paris, and Daniel Ebbo, Velizy, both of France, assignors to Serdaneli, Paris, France
Filed Sep. 3, 1985, Ser. No. 773,197
Claims priority, application France, Mar. 5, 1985, 850971
Term of patent 14 years
U.S. Cl. D23—250



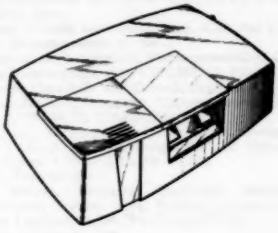
292,731
FAUCET HANDLE
Jesus Gomez, Linares, Mexico, assignor to Fabricas Orion S.A., Mexico
Filed Aug. 19, 1985, Ser. No. 766,973
Term of patent 14 years
U.S. Cl. D23—254



292,732
PEDESTAL LAVATORY
Jon G. Gates, Kohler, Wis.; Paul P. Kolada, Columbus, Ohio, and Michael W. Valentino, Germantown, Wis., assignors to Kohler Co., Kohler, Wis.
Filed Dec. 8, 1986, Ser. No. 939,493
Term of patent 14 years
U.S. Cl. D23—292

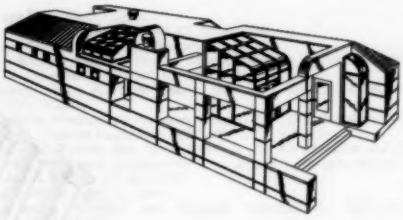
292,733
BOWL FOR A WATER CLOSET OR THE LIKE
Michael B. Robinson, Malvern, and Thomas J. Hollinrake, Toorak, both of Australia, assignors to Merlin Fibreglass Pty. Ltd., Australia
Filed Mar. 5, 1985, Ser. No. 708,235
Term of patent 14 years
U.S. Cl. D23—295

292,734
PUMP HOUSING FOR THE DELIVERY OF DENTAL TREATMENT SOLUTIONS
Francis E. Ryder, Arab, Ala., assignor to Ryder International Corporation, Arab, Ala.
Filed Dec. 30, 1985, Ser. No. 814,691
Term of patent 14 years
U.S. Cl. D24—10

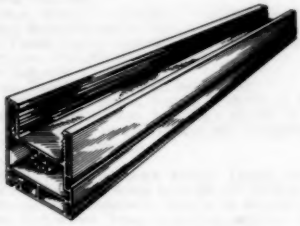


292,735
TUBE FOR THE IMMUNOLOGICAL ADSORPTION ANALYSIS
Uffe Lovborg, Koge, Denmark, assignor to A/S Nunc, Roskilde, Denmark
Filed Apr. 27, 1984, Ser. No. 604,573
Claims priority, application Denmark, Nov. 2, 1983, MA1983N01034
Term of patent 14 years
U.S. Cl. D24—29

292,736
MODULAR BUILDING
Barry A. Berkus, 223 E. De La Guerra St., Santa Barbara, Calif. 93101
Filed Jan. 28, 1985, Ser. No. 695,548
Term of patent 14 years
U.S. Cl. D25—1

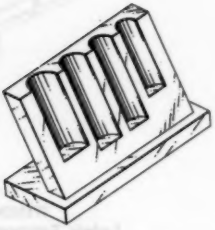


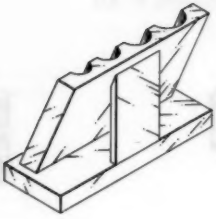
292,737
WINDOW COMPONENT EXTRUSION
Ludwig Reisinger, McPherson, and Dennis Westphal, Galva, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Oct. 24, 1984, Ser. No. 664,410
Term of patent 14 years
U.S. Cl. D25—125



292,738
FLUORESCENT LAMP
Mitsuyuki Futatsugi; Yoshihiro Domon, and Hitoshi Yamazaki, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 8, 1985, Ser. No. 803,984
Claims priority, application Japan, Aug. 14, 1985, 60-34839
Term of patent 14 years
U.S. Cl. D26—3

292,739
COIN ORGANIZER
David Izant, 260 W. Portola Ave., Los Altos, Calif. 94022
Filed May 6, 1985, Ser. No. 730,952
Term of patent 14 years
U.S. Cl. D99—34





LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF NOVEMBER, 1987

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
Malik, Arshad H., 4,705,665, Cl. 422-12.000.

A. H. Robins Company, Inc.: *See*—
Cale, Albert D., Jr., 4,705,853, Cl. 540-490.000.

A. Nattermann & CIE GmbH: *See*—
Lautenschlager, Hans-Heiner; Parnham, Michael J.; Leyck, Sigurd; Winkelmann, Johannes; and Brekle, Axel, 4,705,802, Cl. 514-438.000.

A/S Kongsberg Vapenfabrikk: *See*—
Mowill, R. Jan, 4,704,861, Cl. 60-39.320.

AAI Corporation: *See*—
Milstead, Leon R.; Lowe, Laban R.; Schnepfe, Robert W., Jr.; and Erickson, Merlin L., 4,704,967, Cl. 102-334.000.
Sellman, Leonard R.; Embury, Janon F., Jr.; and Beyth, Werner W., 4,704,966, Cl. 102-334.000.

Abe, Masaru: *See*—
Kawai, Yoichi; Abe, Masaru; Yoshihara, Akio; Hayashi, Shigeru; and Sekiguchi, Katsumi, 4,705,818, Cl. 523-200.000.

Abe, Seiko: *See*—
Sakakibara, Yasuyuki; Abe, Seiko; Tomita, Masahiro; Yorita, Hiroshi; Tanaka, Takeshi; and Igashira, Toshihiko, 4,705,003, Cl. 123-449.000.

Abe, Susumu: *See*—
Ota, Kazuhide; and Abe, Susumu, 4,705,762, Cl. 501-87.000.

Abe, Takao; and Ogaga, Tetsuo, to Sony Corporation. Method of error modification for video data. 4,706,111, Cl. 358-21.00R.

Abel, Heinz; Schafer, Paul; and Berendt, Hans-Ulrich, to CIBA-GEIGY Corporation. Water-soluble or water-dispersible graft polymers, process for their preparation and the use thereof. 4,705,525, Cl. 8-555.000.

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Abiko, Kenji: *See*—
Kimura, Hiroshi; and Abiko, Kenji, 4,705,366, Cl. 350-529.000.

Abraham, Nedumparambil A.: *See*—
Sestanj, Kazimir; Abraham, Nedumparambil A.; Bellini, Francesco; and Treasurywala, Adi, 4,705,882, Cl. 560-10.000.

Abrahamson, Gerald R.; and Duwell, Ernest J., to Minnesota Mining and Manufacturing Company. Cutting element with wear resistant crown. 4,705,124, Cl. 175-410.000.

Abthoff, Joerg; Schuster, Hans-Dieter; Loose, Gunter; and Jokl, Bernhard, to Daimler-Benz Aktiengesellschaft. Exhaust gas filter for diesel engines. 4,704,863, Cl. 60-311.000.

Abukawa, Toshimi: *See*—
Ito, Motoya; Takahashi, Noriyoshi; Watanabe, Masatoshi; Abukawa, Toshimi; Seya, Takeshi; Kainuma, Hiroshi; and Syutoo, Toshiyuki, 4,704,789, Cl. 29-609.000.

Acampora, Alfonse A.: *See*—
Fedele, Nicola J.; and Acampora, Alfonse A., 4,706,260, Cl. 375-27.000.

Achatz, Florian: *See*—
Wentzel, Peter; Huber, Erich; Weiss, Eckardt; and Achatz, Florian, 4,706,136, Cl. 360-39.000.

Achtenberg, Theo: *See*—
Weber, Wilhelm; Sockel, Karl H.; Achtenberg, Theo; and Sattlegger, Hans, 4,705,826, Cl. 524-860.000.

Ackeret, Peter, to Ind Inventions and Development of Novelties AG. Container for a gramophone record or video disc. 4,705,166, Cl. 206-309.000.

Acrometal Products, Inc.: *See*—
Steinback, Clarence I., 4,704,823, Cl. 51-110.000.

Acton, Edward M.; Ryan, Kenneth J.; and Tracy, Michael, to SRI International. C-glycosidic adriamycin analogs. 4,705,850, Cl. 536-1.100.

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Addleman, Lloyd A.: *See*—
Addleman, David A.; and Addleman, Lloyd A., 4,705,401, Cl. 356-376.000.

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Advanced Medical Devices, Inc.: *See*—
Beck, Blaine E., 4,705,073, Cl. 137-625.250.

Advanced Micro Devices, Inc.: *See*—
Qayyum, Asif, 4,706,266, Cl. 377-33.000.

Aerotel Ltd.: *See*—
Kamil, Zvi, 4,706,275, Cl. 379-144.000.

Affarsverket FFV: *See*—
Andersson, Henry, 4,705,491, Cl. 464-167.000.

Ages Italia S.p.A.: *See*—
Bona, Cesare, 4,704,960, Cl. 101-93.120.

Agfa Gevaert Aktiengesellschaft: *See*—
Klotzer, Sieghart; Mucke, Bruno; Mahlberg, Gunther; and Becker, Manfred, 4,705,747, Cl. 430-550.000.

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Agoston, Andras; and Mattsson, Lennart P. J., to U.S. Philips Corporation. Tunable magnetron. 4,705,990, Cl. 315-39.550.

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Ahlquist, Norman C.: *See*—
Baatz, Wilfried; and Ahlquist, Norman C., 4,706,083, Cl. 340-825.060.

Ahmari, Hossein: *See*—
Colineau, Joseph; and Ahmari, Hossein, 4,706,115, Cl. 358-60.000.

Ahrens, Uwe, to Mecron medizinische Produkte GmbH. Implant. 4,705,520, Cl. 623-23.000.

Aichi Steel Works, Ltd.: *See*—
Honkura, Yoshinobu; Murata, Kouji; and Yokoyama, Takashi, 4,705,581, Cl. 148-307.000.

Aida Engineering, Ltd.: *See*—
Komatsu, Isamu; and Serizawa, Kenkichi, 4,706,004, Cl. 318-568.000.

Ainsworth, Walter W.; and Metz, Arthur J., to Tektronix, Inc. Programmable sweep generator. 4,705,961, Cl. 307-228.000.

Air Products and Chemicals, Inc.: *See*—
Agrawal, Rakesh; and Auvil, Steven R., 4,705,548, Cl. 62-22.000.
Sircar, Shivaji, 4,705,541, Cl. 55-26.000.

Air Stamping, Inc.: *See*—
Robertson, Albert W., 4,704,964, Cl. 101-425.000.

Aisan Kogyo Kabushiki Kaisha: *See*—
Ando, Tsuneo; Kasuya, Kazusato; Asada, Yukitoshi; and Sugimoto, Hironobu, 4,705,002, Cl. 123-440.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Ikeyama, Takeshi, 4,706,072, Cl. 340-576.000.
Mita, Hideo; and Kurazono, Shuichi, 4,705,097, Cl. 165-4.000.
Takeda, Hisanobu; and Aso, Yasuhiro, 4,704,748, Cl. 4-420.400.
Yamada, Yukifumi; Terada, Takami; and Miyagawa, Toshihito, 4,705,318, Cl. 297-362.000.

Akagawa, Masaki: *See*—
Kobayashi, Osamu; Akagawa, Masaki; Tanaka, Masanori; Ishii, Jun; and Yamagishi, Ryoji, 4,706,202, Cl. 364-479.000.

Akai, Takayuki; and Yamaguchi, Junichi, to International Business Machines Corporation. Image processing apparatus with reduced handling and storage. 4,706,205, Cl. 364-518.000.

Akashi, Akira: *See*—
Yamamoto, Hiroshi; and Akashi, Akira, 4,705,380, Cl. 354-402.000.

Akebono Brake Industry Co., Ltd.: *See*—
Ogino, Kinji, 4,705,093, Cl. 164-97.000.
Tsugawa, Kazuo; and Wada, Susuma, 4,705,817, Cl. 523-152.000.

Akebono Research and Development Centre Ltd.: *See*—
Ogino, Kinji, 4,705,093, Cl. 164-97.000.
Tsugawa, Kazuo; and Wada, Susuma, 4,705,817, Cl. 523-152.000.

Akhtar, Masud, to Chronar Corporation. Conductive tin oxide methods. 4,705,701, Cl. 427-110.000.

Akiyama, Ikuo, to NEC Corporation. Solid-state imaging device compatible with different television systems. 4,706,122, Cl. 358-213.130.

Akiyama, Shigeo; and Satou, Shigeji, to Kurashiki Boseki Kabushiki Kaisha. Apparatus for blowing a thread end off of a full cheese formed by an open-end spinning and winding machine. 4,705,224, Cl. 242-35.60E.

Aktiebolaget SKF: *See*—
Kellstrom, Magnus, 4,705,411, Cl. 384-450.000.

Akutagawa, Susumu: *See*—
Okano, Tamon; Kumobayashi, Hidenori; Akutagawa, Susumu; Kiji, Jitsuo; Konishi, Hisatoshi; Fukuyama, Keiichi; and Shimano, Yasunobu, 4,705,895, Cl. 564-15.000.

Akzo N.V.: *See*—
Hummelen, Jan C.; Meijer, Egbert W.; and Wynberg, Hans, 4,705,847, Cl. 530-350.000.
Kundinger, Ernst F.; Klimesch, Erich; Zengel, Hans-Georg; and Lasher, Jeffery D., 4,705,720, Cl. 428-332.000.
Logan, Robert T.; Redpath, James; and Roy, Robert G., 4,705,782, Cl. 514-150.000.
Meijer, John; Westmijze, Hans; and Boelema, Eltjo, 4,705,888, Cl. 560-302.000.

Albrecht, Klaus: *See*—
Geissler, Ulrich; and Albrecht, Klaus, 4,705,740, Cl. 430-288.000.

Alcatel: *See*—
Barbier, Guy; and Amory, Jean-Paul, 4,706,058, Cl. 336-96.000.

Alcatel N.V.: *See*—
Hopfensperger, Reinhold, 4,705,453, Cl. 415-119.000.
Alcock, Ralph: *See*—
Christianson, Leslie L.; Alcock, Ralph; Froehlich, Donell P.; and Chicoine, Kellen J., 4,705,449, Cl. 414-68.500.
Alden, Wayne S., III: *See*—
Sicard, Stephen T.; Pedro, Brian A.; and Alden, Wayne S., III, 4,705,333, Cl. 439-71.000.
Aldrich, James R., to United States of America, Air Force. Ferrous and sulfide treatment of electroplating wastewater. 4,705,639, Cl. 210-720.000.
Alexander, David C., to Texaco Inc. Process for producing bicyclic diamines. 4,705,897, Cl. 564-445.000.
Alfa Romeo Auto S.p.A.: *See*—
Ciccarone, Angelo, 4,706,197, Cl. 364-431.080.
Alford, Richard M., to Amoco Corporation. Method of vertical seismic profiling and exploration. 4,706,224, Cl. 367-41.000.
ALH Systems, Ltd.: *See*—
Carruthers, Alec R., 4,705,116, Cl. 175-19.000.
Allen-Bradley Company, Inc.: *See*—
Kerkman, Russel J.; and Rowan, Timothy M., 4,706,012, Cl. 323-280.000.
Allen, James D.; and McVay, David M., to Eastman Kodak Company. Toner concentration monitor. 4,706,032, Cl. 328-1.000.
Allen, Leslie J.; Cherian, Gabe; and Diaz, Stephen H., to Raychem Corporation. Chip carrier mounting device. 4,705,205, Cl. 228-180.200.
Allied Colloids Limited: *See*—
Symes, Kenneth C.; Langley, John; and Mistry, Kishor K., 4,705,825, Cl. 524-732.000.
Whittaker, Tony, 4,705,640, Cl. 210-733.000.
Allied Corporation: *See*—
Bonfield, John H.; and Ulmer, Harry E., 4,705,904, Cl. 570-142.000.
Brown, Arthur K., Jr., 4,704,867, Cl. 60-554.000.
Myers, Martin G.; and Barrett, William A., 4,705,486, Cl. 445-17.000.
Roberts, William J., 4,706,151, Cl. 361-6.000.
Tarter, James H., 4,705,146, Cl. 188-73.100.
Van Der Puy, Michael; Soriano, David S.; and Dimmit, Jeffrey H., 4,705,896, Cl. 564-265.000.
Almestad, Henry C. Concealed hinge. 4,704,766, Cl. 16-236.000.
Almquist, Ronald G.; and Olsen, Cris M., to SRI International. Orally active LHRH analogs. 4,705,778, Cl. 514-15.000.
Alper, Howard; and Smith, David J. H., to British Petroleum Company p.l.c., The. Carbonylation of mercaptans. 4,705,880, Cl. 558-257.000.
Alpine Electronics Inc.: *See*—
Ouchida, Kenji, 4,706,294, Cl. 381-109.000.
Alps Electric Co., Ltd.: *See*—
Matsunaga, Hiroshi; Tokunaga, Ichiro; Shimojima, Yoji; and Obata, Kosei, 4,705,348, Cl. 350-96.150.
Alternate Resources PLC: *See*—
Newel-Lewis, Jan, 4,705,182, Cl. 215-230.000.
Altman Stage Lighting Co., Inc.: *See*—
Solomon, Dennis, 4,706,006, Cl. 318-640.000.
Altop S.A.: *See*—
Jordi, Urs M., 4,705,408, Cl. 368-278.000.
Aluminum Company of America: *See*—
Evert, Robert P.; and Miller, James A., 4,704,886, Cl. 72-57.000.
Hornack, Thomas R.; and Brown, Melvin H., 4,705,106, Cl. 165-179.000.
Levendusky, Thomas L.; Benson, Arthur; and Lunden, Richard W., 4,705,927, Cl. 219-10.55E.
Alvord, Robert J.: *See*—
Okrzesik, Thaddeus P.; and Alvord, Robert J., 4,706,044, Cl. 331-113.00R.
ALZA Corporation: *See*—
Wong, Patrick S. L.; and Theeuwes, Felix, 4,705,515, Cl. 604-892.000.
Ambrose, William: *See*—
Perten, Herbert; and Ambrose, William, 4,706,131, Cl. 358-302.000.
Ament, Harold E.; and Kirschner, Frederick G., to Ideas That Sell, Inc. Cushioned bat. 4,705,273, Cl. 273-72.00R.
American Can Company: *See*—
Briggs, Jerald E.; and Pfutzenreuter, Henry, 4,705,708, Cl. 428-35.000.
American Cyanamid: *See*—
Scott, Jane V.; and Waggett, Joseph F., 4,705,686, Cl. 424-92.000.
American Cyanamid Company: *See*—
Carter, Guy T.; Greenstein, Michael; Goodman, Joseph J.; Borders, Donald B.; Maiese, William M.; and Testa, Raymond T., 4,705,688, Cl. 424-122.000.
Paul, Albert P.; and Card, Roger J., 4,705,570, Cl. 106-124.000.
Wang, David W.; Casey, Donald J.; and Lehmann, Leonard T., 4,705,820, Cl. 524-381.000.
American Tech Manufacturing, Inc.: *See*—
Linker, Frank V.; and Linker, Frank V., Jr., 4,705,152, Cl. 193-39.000.
American Telephone and Telegraph Company: *See*—
Cubbison, Richard J., Jr., 4,706,281, Cl. 379-322.000.
American Telephone and Telegraph Company, AT&T Bell Laboratories: *See*—
Budrikis, Zigmantas L.; Hatamian, Mehdi; Kubik, Peter S.; and Netravali, Arun N., 4,705,942, Cl. 250-227.000.
Helms, Howard D., 4,706,208, Cl. 364-580.000.
Hinton, Harvard S.; and Ostrander, John L., 4,705,344, Cl. 350-3.730.
McCullough, Harold E., 4,706,056, Cl. 335-192.000.
Turnpaugh, George F., 4,705,970, Cl. 307-600.000.
Yiannoulos, Aristides A., 4,705,322, Cl. 361-91.000.
American Telephone and Telegraph Co., AT&T Bell Labs: *See*—
Payne, William A., III, 4,706,240, Cl. 370-60.000.
Ammen, Mark E.; and Hansen, William D. Sail system. 4,704,979, Cl. 114-98.000.
Amoco Corporation: *See*—
Alford, Richard M., 4,706,224, Cl. 367-41.000.
Bourg, Robert A., 4,705,111, Cl. 166-277.000.
Kawakami, James H.; Harris, James E.; Maresca, Louis M.; Robeson, Lloyd M.; and Cotter, Robert J., 4,705,822, Cl. 524-425.000.
Warren, Tommy M.; Winters, Warren J.; and Brett, J. Ford, 4,705,117, Cl. 175-65.000.
Amory, Jean-Paul: *See*—
Barbier, Guy; and Amory, Jean-Paul, 4,706,058, Cl. 336-96.000.
AMP Incorporated: *See*—
Hayes, Earl J.; and Cooper, Ralph M., 4,705,339, Cl. 439-277.000.
Loose, Winfield W., 4,705,340, Cl. 439-395.000.
Amphenol Corporation: *See*—
L'Henaff, Patrick; and Bricaud, Herve, 4,706,164, Cl. 361-382.000.
Margolin, Mark; and Grois, Igor, 4,705,352, Cl. 350-96.200.
Pritchard, Philip N. W., 4,705,481, Cl. 439-417.000.
Amstutz, Hermann; Kaufmann, Meinolph; Nehring, Jurgen; and Scheffer, Terry J., to BBC Brown, Boveri & Company, Limited. Process and apparatus for the production of an orientation layer on a plane surface of a plate, and liquid crystal substrate plate produced thereby. 4,705,359, Cl. 350-341.000.
Ancelle, Eric J., to BECAP. Pin, especially for clamping a sleeve-shaped protector or centering device on its tube serving for drilling an underground deposit. 4,705,121, Cl. 175-325.000.
Andersen, Per F. Wave generating apparatus. 4,705,428, Cl. 405-79.000.
Anderson, Greenwood & Company: *See*—
McNeely, Michael D.; and Powell, Walter W., 4,705,065, Cl. 137-484.600.
Anderson Machine Works: *See*—
Boling, Monte J., 4,705,156, Cl. 198-392.000.
Anderson, Michael H.: *See*—
Wigness, Bruce D.; and Anderson, Michael H., 4,705,501, Cl. 604-43.000.
Anderson, Michael W.: *See*—
Van Malderghem, Edmund G.; Monico, Dominick L.; and Anderson, Michael W., 4,705,298, Cl. 282-11.50A.
Andersson, Henry, to Affarsverket FFV. Telescopic guide, especially for transmittance of torque. 4,705,491, Cl. 464-167.000.
Andersson, Sture R.; Haland, Lars Y.; and Morner, Bengt O. J. S., to Autoliv Development AB. Seat belt pre-tensioning device. 4,705,296, Cl. 280-806.000.
Ando, Tsuneo; Kasuya, Kazusato; Asada, Yukitoshi; and Sugimoto, Hironobu, to Aisan Kogyo Kabushiki Kaisha. Electronic air-fuel mixture control system for internal combustion engine. 4,705,002, Cl. 123-440.000.
Andresen, Brian D.; and Fought, Eric R., to Sepragen Corporation. Electrophoresis-mass spectrometry probe. 4,705,616, Cl. 204-299.00R.
Andrews, Frank P., to Smiths Industries Public Limited Company. Microstrip devices. 4,706,050, Cl. 333-205.000.
Andrich, Patrick J.: *See*—
Dudley, Jerry W.; and Andrich, Patrick J., 4,705,140, Cl. 182-3.000.
Angel, Henry R.: *See*—
Hennessy, James W.; Angel, Henry R.; and Carlson, Richard A., 4,706,207, Cl. 364-555.000.
Angenieux-CLB S.A.: *See*—
Lauzier, Rene; Rollin, Jean; Choquelle, Jean; Dumas, Gerard; Breat, Francois; Rousson, Maurice; and Defour, Paule, 4,705,286, Cl. 280-281.00R.
Antolik, William J.: *See*—
Reina, Leo J.; and Antolik, William J., 4,706,269, Cl. 378-154.000.
Aoki, Tsutomu: *See*—
Nagata, Wataru; Aoki, Tsutomu; and Nishitani, Yasuhiro, 4,705,852, Cl. 540-301.000.
Aoshima, Shinichirou: *See*—
Tsuchiya, Yutaka; Aoshima, Shinichirou; and Takeshima, Akira, 4,705,397, Cl. 356-345.000.
Applied Power Inc.: *See*—
Mondloch, Michael J.; and Skover, Nick, Jr., 4,705,271, Cl. 272-130.000.
Arai, Keiichi, to Olympus Optical Co., Ltd. Endoscope having rotatable clamp inserting section. 4,705,023, Cl. 128-4.000.
Arai, Yoshinao; Takahashi, Shino; Oikawa, Eigo; Sato, Shigeru; and Kobayashi, Hideaki, to Hitachi, Ltd. Method of and apparatus for preparing numerical control data for inserting components. 4,706,187, Cl. 364-191.000.
Araya, Abraham; and Lowe, Barrie M., to Imperial Chemical Industries PLC. Synthesis of zeolite EU-13 from a reaction mixture containing tetramethylammonium compound. 4,705,674, Cl. 423-277.000.
Arbter, Conrad, to Pfaff Industriemaschinen GmbH. Device for aligning and cutting lengths of material. 4,704,928, Cl. 83-175.000.
Archibald, G. Kent, to Minnesota Mining and Manufacturing Company. Multiple solution IV system with setup error protection. 4,705,506, Cl. 604-81.000.
Archibald, Stephen J. Cooking apparatus. 4,704,955, Cl. 99-339.000.
Archung, Ralph, to Boeing Company, The. Hydraulic reserve system for aircraft. 4,704,865, Cl. 60-405.000.

Arditty, Herve : *See*—
Graindorge, Philippe; Arditty, Herve ; and Lefevre, Herve , 4,705,399, Cl. 356-350.000.

Arimond, Timothy V., to Surgidev Corporation. Medicine pump. 4,705,464, Cl. 417-477.000.

Aristech Chemical Corporation: *See*—
Cullo, Leonard A.; Nagle, Elliott V., Jr.; Restelli, Edward F., Jr.; and Yogan, Thomas J., 4,705,770, Cl. 502-242.000.

Ariyoshi Nakamura: *See*—
Nakajima, Kenji, 4,704,885, Cl. 72-50.000.

Armaturenfabrik Wallisellen AG: *See*—
Egli, Werner, 4,705,072, Cl. 137-625.170.

Arndt, Douglas C.: *See*—
Hedgcoth, Virgil; and Arndt, Douglas C., 4,705,299, Cl. 283-68.000.

Arnold, Larry J., to Arnold Technologies, Inc. Self locking sheet metal screw. 4,705,441, Cl. 411-188.000.

Arnold Technologies, Inc.: *See*—
Arnold, Larry J., 4,705,441, Cl. 411-188.000.

Arnoldi, Walter E., administrator: *See*—
Arnoldi, Walter E., deceased; and Arnoldi, Walter E., administrator, 4,705,413, Cl. 400-56.000.

Arnoldi, Walter E., deceased; and Arnoldi, Walter E., administrator, to Pitney Bowes Inc. Thickness compensating means for mailing machine. 4,705,413, Cl. 400-56.000.

Arnolds, Gerhard: *See*—
Grothe, Horst; and Arnolds, Gerhard, 4,705,094, Cl. 164-426.000.

Arora, Arvind, to Photoacoustic Technology, Inc. Automation control apparatus. 4,704,905, Cl. 73-596.000.

Arrington, John P.: *See*—
Shen, Nelson M.; Moisson, Marc F.; Arrington, John P.; and Tayeb, AbdulMohamed, 4,705,347, Cl. 350-96.150.

Arsenault, Michael J.: *See*—
Reimels, Harry G.; Walsh, David A.; and Arsenault, Michael J., 4,705,500, Cl. 604-35.000.

Arthur D. Little, Inc.: *See*—
Rosa, Mehmet, 4,706,251, Cl. 372-4.000.

Asada, Takafumi; Yoshida, Cyuryo; Shioyama, Tadao; and Kurose, Kazuyoshi, to Matsushita Electric Industrial Co., Ltd. Rotary head cylinder device with fluid bearing. 4,706,143, Cl. 360-107.000.

Asada, Takafumi; Yoshida, Cyuryo; Shioyama, Tadao; and Hosokawa, Yoshiteru, to Matsushita Electric Industrial Co., Ltd. Rotary head device with fluid bearing. 4,706,144, Cl. 360-107.000.

Asada, Yukitoshi: *See*—
Ando, Tsuneo; Kasuya, Kazusato; Asada, Yukitoshi; and Sugimoto, Hironobu, 4,705,002, Cl. 123-440.000.

Asahi Glass Company Ltd.: *See*—
Hayashi, Atsuhi; Kuwabara, Kiyoharu; Sakai, Kohzo; and Ishino, Toshihiro, 4,705,763, Cl. 501-103.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kirigaya, Tadayuki; and Taguchi, Ichiro, 4,705,375, Cl. 354-275.000.

Asahi Medical Co., Ltd.: *See*—
Yagita, Koji; and Ono, Yotsuo, 4,705,632, Cl. 210-500.230.

Asahi, Sadaho: *See*—
Minami, Hiroo; and Asahi, Sadaho, 4,704,770, Cl. 24-431.000.

Asako, Shigeru: *See*—
Okita, Koichi; Toyooka, Shinichi; Asako, Shigeru; and Yamada, Katsuya, 4,705,544, Cl. 55-158.000.

Asakura, Hideo, to Brother Kogyo Kabushiki Kaisha. Positioning device for positioning type-wheel index motor in a printer. 4,705,416, Cl. 400-144.200.

Asakura, Masahiko: *See*—
Hibino, Yoshitaka; Fukuzawa, Takeshi; Sato, Hiromitsu; and Asakura, Masahiko, 4,705,011, Cl. 123-589.000.
Kawanabe, Tomohiko; Asakura, Masahiko; Kushida, Noritaka; Shiina, Takanori; and Muroya, Minoru, 4,705,012, Cl. 123-589.000.

Asayama, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Exhaust gas recirculation control system for an engine. 4,705,009, Cl. 123-571.000.

Asazuma, Harumitsu: *See*—
Yamanaka, Masaaki; Inoue, Masayuki; and Asazuma, Harumitsu, 4,705,719, Cl. 428-323.000.

Aschberger, Matthias; Farber, Karlheinz; and Deininger, Anton, to Coca-Cola Company, The. Circulation pump system in a storage vessel. 4,705,193, Cl. 222-146.600.

Asea Stal Aktiebolag: *See*—
Brannstrom, Roine, 4,705,433, Cl. 406-63.000.

Ashland Oil, Inc.: *See*—
Goel, Anil B., 4,705,838, Cl. 528-48.000.

Askove Kunststof Industrie B.V.: *See*—
van Aspert, Joan J. A. M., 4,705,303, Cl. 285-309.000.

Aso, Toshiyuki; and Tshibashi, Tamotu, to Fanuc Ltd. Electrical discharge boring machine. 4,705,932, Cl. 219-69.00V.

Aso, Yasuhiro: *See*—
Takeda, Hisanobu; and Aso, Yasuhiro, 4,704,748, Cl. 4-420.400.

Assaf, Gad, to Geophysical Engineering Company. Apparatus for producing power using concentrated brine. 4,704,993, Cl. 122-21.000.

Astegiano, Luciano; Bertoglio, Ottavio; Bosco, Fulvio; de Bosio, Alfredo; Franco, Dario; Lampiano, Piero; Melle, Antonio; and Rosboch, Luciano, to Societa' Italiana per l'Esercizio Telefonico p.a. Equipment for sending digitally pre-stored voice announcements to the subscribers connected to a telephone network. 4,706,270, Cl. 379-2.000.

Astle, Lynn: *See*—
Grahn, Allen R.; and Astle, Lynn, 4,704,909, Cl. 73-862.040.

Astoin, Jaques N.: *See*—
Massot, Jacqueline O.; and Astoin, Jaques N., 4,705,780, Cl. 514-54.000.

Astolfi, Pietro, to Pico-Glass S.p.A. Picture frame with table top support element. 4,704,814, Cl. 40-152.100.

AT&T Bell Laboratories: *See*—
Choi, Jae H.; Kanotz, William M.; and Vesperman, William C., 4,705,823, Cl. 524-474.000.

AT&T Information Systems Inc.: *See*—
Cubbison, Richard J., Jr., 4,706,281, Cl. 379-322.000.

AT&T Technologies: *See*—
Choi, Jae H.; Kanotz, William M.; and Vesperman, William C., 4,705,823, Cl. 524-474.000.

Ataka, Yasukazu, to Sharp Kabushiki Kaisha. Portable vacuum cleaner. 4,704,765, Cl. 15-323.000.

Atalar, Abdullah, to Ernst Leitz Wetzlar GmbH. Wide-band matching network for piezoelectric transducer. 4,706,048, Cl. 333-32.000.

Ateliers de la Rive: *See*—
Lauzier, Rene; Rollin, Jean; Choquelle, Jean; Dumas, Gerard; Breat, Francois; Rousson, Maurice; and Defour, Paule, 4,705,286, Cl. 280-281.00R.

Ateliers Wood Inc.: *See*—
Poirier, Clovis; Banville, Marcel; McDonald, Mario; McDonald, Sabin; Johnston, Stephen; and Masson, Jean-Rene, 4,704,815, Cl. 43-4.000.

Athanassiu, Christos: *See*—
St. Laurent, Wilfred; and Athanassiu, Christos, 4,705,458, Cl. 417-46.000.

Atkins, David A.; and Atkins, Donald F., to Ero-Con, Inc. Erosion control apparatus. 4,705,427, Cl. 405-36.000.

Atkins, Donald F.: *See*—
Atkins, David A.; and Atkins, Donald F., 4,705,427, Cl. 405-36.000.

Atkinson, Noel: *See*—
Baker, William; Pedigo, Michael K.; Atkinson, Noel; and Shelton, Henry P., 4,706,274, Cl. 379-61.000.

Atkinson, William G., to Somerville Belkin Industries Inc. Microwave trays. 4,705,929, Cl. 219-10.55E.

Atlantic Richfield Company: *See*—
Gastinger, Robert G., 4,705,866, Cl. 548-549.000.
Le-Khac, Bi, 4,705,773, Cl. 502-402.000.
Perkins, Thomas K., 4,705,113, Cl. 166-302.000.

Aubert, Benjamin A. Body lift and walker for paralytics. 4,704,749, Cl. 5-81.00B.

Aubert, Stephen A. Desensitized explosive composition. 4,705,582, Cl. 149-92.000.

Auger, Mederic E.: *See*—
Viertl, John R. M.; and Auger, Mederic E., 4,706,020, Cl. 324-238.000.

Ausnit, Steven, to Minigrip, Inc. Foldable top bag and method. 4,706,297, Cl. 383-63.000.

Autoliv Development AB: *See*—
Andersson, Sture R.; Haland, Lars Y.; and Morner, Bengt O. J. S., 4,705,296, Cl. 280-806.000.

Automotive Product plc: *See*—
Leigh-Monstevens, Keith V.; Nix, Richard A.; and Patalidis, Claude A., deceased, 4,705,151, Cl. 192-111.00A.

Auvil, Steven R.: *See*—
Agrawal, Rakesh; and Auvil, Steven R., 4,705,548, Cl. 62-22.000.

AVCO Synthetic Turf Production Distribution, Inc.: *See*—
Avery, George S., 4,705,706, Cl. 428-17.000.

Avdel Limited: *See*—
Bennett, Ralph H., 4,705,201, Cl. 227-55.000.
Frearson, William H., 4,704,888, Cl. 72-391.000.

Avella, Frank: *See*—
Watson, George A.; Co, Ramon S.; Fuhrman, James L.; and Avella, Frank, 4,706,244, Cl. 370-69.100.

Avery, George S., to AVCO Synthetic Turf Production Distribution, Inc. Tufted carpeting having stitches thermally bonded to backing. 4,705,706, Cl. 428-17.000.

Avila, Louis J.; Merritt, John E.; and Hempling, Norman G., to Ford Aerospace & Communications Corporation. Frequency extended digitally generated FM. 4,706,047, Cl. 332-19.000.

AVL AG: *See*—
Marsoner, Hermann; Kirchmayer, Gerald; and List, Helmut, 4,704,893, Cl. 73-1.00G.
Marsoner, Hermann; and Kleinhappl, Erich, 4,705,667, Cl. 422-68.000.

Ayerst, McKenna & Harrison, Inc.: *See*—
Sestanj, Kazimir; Abraham, Nedumparambil A.; Bellini, Francesco; and Treasurywala, Adi, 4,705,882, Cl. 560-10.000.

Aylett, Martin R.: *See*—
Haigh, John; and Aylett, Martin R., 4,705,593, Cl. 156-635.000.

Ayliffe, Peter J.; and Davey, Anthony B., to STC PLC. Addressing liquid crystal cells using unipolar strobe pulses. 4,705,345, Cl. 350-350.00S.

Azygous: *See*—
Houghtaling, Steven W., 4,706,226, Cl. 367-66.000.

B.F. Goodrich Company, The: *See*—
Kugelman, Michael M., 4,706,160, Cl. 361-100.000.

B.I. Industries, Inc.: *See*—
Chiu, Kai F., 4,705,601, Cl. 162-348.000.

Baatz, Wilfried; and Ahlquist, Norman C., to FloScan Instrument Company, Inc. Fuel economy indicator. 4,706,083, Cl. 340-825.060.

Baba, Takashi: *See*—
Senda, Tetsuji; and Baba, Takashi, 4,705,566, Cl. 106-3.000.

Baba, Takeshi; and Suda, Shigeyuki, to Canon Kabushiki Kaisha. Focus detecting device which varies between a varying state and a fixed state. 4,706,124, Cl. 358-227.000.

Babcock & Wilcox Company, The: *See*—
Gerber, David W.; and Untch, Frederick M., 4,705,098, Cl. 165-4.000.
Kaya, Azmi; and Rice, Larry, 4,704,805, Cl. 34-31.000.

Babel, Werner, to MAHO Aktiengesellschaft. Tool holder for milling or boring machine. 4,705,440, Cl. 409-233.000.

Baberowski, Waldemar: *See*—
Spiess, Karl; Baberowski, Waldemar; and Glatter, Otto, 4,704,782, Cl. 29-434.000.

Bachl, Robert: *See*—
Warzelhan, Volker; Bachl, Robert; Ball, Wolfgang; Funk, Guido; and Laun, Martin, 4,705,835, Cl. 526-116.000.

Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Wynn, David K.; and Gregg, James R., to Dayton Reliable Tool & Mfg. Co. Method and apparatus for making shells for can ends. 4,704,887, Cl. 72-347.000.

Bacon, Kenneth: *See*—
Bacon, Rosemarie; and Bacon, Kenneth, 4,705,051, Cl. 132-79.00A.

Bacon, Rosemarie; and Bacon, Kenneth. Powdered cosmetic container. 4,705,051, Cl. 132-79.00A.

Bacsa, Gyorgy: *See*—
Madi-Szabo, Laszlo ; Morvai, Margit; Horvath nee Feher, Eva; Jansco, Sandor; Tamasi, Piroska; Kovacs, Istvan; Kiss nee Loss, Ilona Maria; Bacsa, Gyorgy; Kubala nee Papp, Maria; and Bene nee Horvath, Magdolna, 4,705,779, Cl. 514-27.000.

Bador S.A.: *See*—
Lauzier, Rene; Rollin, Jean; Choquelle, Jean; Dumas, Gerard; Breat, Francois; Rousson, Maurice; and Defour, Paule, 4,705,286, Cl. 280-281.00R.

Baglioni, Alessandro, to Medosan Industrie Biochimiche Riunite S.p.A. Derivatives of 2-amino-thiazole having an acid secretion inhibiting activity. 4,705,873, Cl. 549-494.000.

Bahrle, Dieter; Schwerdt, Friedrich; and Stehling, Jurgen H., to International Business Machines Corporation. Process for producing printed circuits. 4,705,592, Cl. 156-630.000.

Bailey, John S.: *See*—
Tullis, Barclay J.; Bailey, John S.; Gunawardena, D. R.; and Kaempf, Ulrich, 4,705,444, Cl. 414-226.000.

Bailey, Wilber H., to Camino Laboratories, Inc. Output circuit for physiological measuring instruments. 4,705,047, Cl. 128-672.000.

Baines, Roger F., to Johnson Electric Industrial Manufactory Limited. Solderless electrical connection in a motor. 4,705,972, Cl. 310-71.000.

Bainton, Cedric R. Laryngoscope for use with pharyngeal obstructions. 4,705,024, Cl. 128-11.000.

Baird, Eric A. Toy parachute. 4,705,239, Cl. 244-155.00R.

Baker, Charles D.; Brimhall, Owen D.; and Galway, Charles R., to University of Utah Research Institute. Artificial sphincter apparatus and method. 4,705,518, Cl. 623-14.000.

Baker, Frederick J.: *See*—
Hart, John H.; and Baker, Frederick J., 4,706,081, Cl. 340-825.030.

Baker, Gerald S., to Cameron Iron Works, Inc. Choke and improved needle tip therefor. 4,705,062, Cl. 137-315.000.

Baker, Walter: *See*—
Council, Malcolm N.; and Baker, Walter, 4,705,107, Cl. 166-170.000.

Baker, William; Pedigo, Michael K.; Atkinson, Noel; and Shelton, Henry P., to Southwestern Bell Telecommunications, Inc. Cordless telephone system. 4,706,274, Cl. 379-61.000.

Bakker, Johannes, to Shell Oil Company. Method and apparatus for filtering the air outlet of a solid sulphur particle production apparatus. 4,705,467, Cl. 425-7.000.

Balassa, Oscar. Method and apparatus for producing rolled product from metal droplets. 4,705,466, Cl. 425-6.000.

Balcke-Durr Aktiengesellschaft: *See*—
Mohr, Karl-Heinz; and Tratz, Manfred, 4,705,057, Cl. 134-180.000.

Balembois, Claude, to Dorr-Oliver Incorporated. Process and device for improving working of liquid pumps. 4,705,462, Cl. 417-395.000.

Balestra, Luciano, to Minnesota Mining and Manufacturing Company. Silver halide photographic material for tanning development and process of producing a relief image. 4,705,738, Cl. 430-264.000.

Ball Corporation: *See*—
Stein, Samuel R., 4,706,042, Cl. 331-94.100.
Stein, Samuel R.; Lewis, Lindon L.; and Smith, Thomas E., 4,706,043, Cl. 331-94.100.

Ball, Wolfgang: *See*—
Warzelhan, Volker; Bachl, Robert; Ball, Wolfgang; Funk, Guido; and Laun, Martin, 4,705,835, Cl. 526-116.000.

Ballard, Paul S. Golf shoe. 4,704,809, Cl. 36-127.000.

Balzer, Dieter, to Huels Aktiengesellschaft. Process for increasing injectability of injection wells in oil extraction by means of water flooding. 4,705,110, Cl. 166-274.000.

Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, to BASF Aktiengesellschaft. Preparation of acyloxybenzenesulfonic acids and their alkali metal and alkaline earth metal salts. 4,705,649, Cl. 260-402.000.

Band & Olufsen A/S: *See*—
Jensen, Jorgen S., 4,706,289, Cl. 381-56.000.

Bandai, Yoshiaki, to Kabushiki Kaisha Toshiba. Graphic memory system for interarea transfer of X-Y coordinate data. 4,706,213, Cl. 364-900.000.

Bandura, Daniel: *See*—
Dolhen, Gerard; Oberlin, Claude; Lemarquis, Jean-Claude; and Bandura, Daniel, 4,705,259, Cl. 251-61.100.

Banville, Marcel: *See*—
Poirier, Clovis; Banville, Marcel; McDonald, Mario; McDonald, Sabin; Johnston, Stephen; and Masson, Jean-Rene, 4,704,815, Cl. 43-4.000.

Baranescu, George S. Injection system with stratified fuel charge. 4,705,010, Cl. 123-575.000.

Barazone, Mounque. Compact apparatus for laying paving fabric. 4,705,229, Cl. 242-86.520.

Barbare, Walter L.; Willey, Harley M.; and Higgins, Ronald D., to Electrotel, Inc. Electronic step-by-step telephone switching system. 4,706,280, Cl. 379-284.000.

Barbier, Guy; and Amory, Jean-Paul, to Alcatel. Miniature inductor with molded cover. 4,706,058, Cl. 336-96.000.

Barbillat, Claude, to Electricite de France. Floating roof tanks for liquid, in particular to storage tanks used in the nuclear power industry. 4,705,185, Cl. 220-222.000.

Barclay, John A.; Stewart, Walter F.; Henke, Michael D.; and Kalash, Kenneth E., to United States of America, Energy. Magnetic refrigeration apparatus with belt of ferro or paramagnetic material. 4,704,871, Cl. 62-3.000.

Barditch, Irving F. Charged aerosol. 4,704,942, Cl. 89-1.110.

Bare, Jeffery E.: *See*—
Vooge, Daryl L.; and Bare, Jeffery E., 4,705,312, Cl. 294-62.000.

Barnard, Ralph G., to Barnhardt Manufacturing Corporation. Absorbent dental roll. 4,705,514, Cl. 604-383.000.

Barnes Engineering Company: *See*—
Worcester, Peter C., 4,705,945, Cl. 250-334.000.

Barnhardt Manufacturing Corporation: *See*—
Barnard, Ralph G., 4,705,514, Cl. 604-383.000.

Barone, Hector D.; and Martin, Jose R. Setting for a cardiac valve. 4,705,516, Cl. 623-2.000.

Barone, Patrizia; and Ramachandran, Pallassana N., to Colgate Palmolive Company. Alpha-sulfo-higher fatty acid-lower alcohol ester- and amide-based detergent laundry bars and process for manufacture thereof. 4,705,644, Cl. 252-135.000.

Barrash, Marshall J., to Coca-Cola Company, The. Can end assembly. 4,705,186, Cl. 220-269.000.

Barrett, William A.: *See*—
Myers, Martin G.; and Barrett, William A., 4,705,486, Cl. 445-17.000.

Barry Wright Corporation: *See*—
Haarmann, Walter; and Bremer, Hans-Joachim, 4,705,489, Cl. 464-69.000.

Bartel Engineering Limited: *See*—
Fry, Timothy S., 4,704,921, Cl. 74-714.000.

Barth, Volker: *See*—
Itzel, Hanshelmut; and Barth, Volker, 4,705,191, Cl. 222-80.000.

Barthold, Klaus: *See*—
Baur, Richard; Oppenlaender, Knut; and Barthold, Klaus, 4,705,834, Cl. 525-540.000.

Bartos, Josef A., to Tire Inflation Systems Corp. Apparatus for controlling air pressure in vehicle tires. 4,705,090, Cl. 152-417.000.

Baruffaldi Frizioni S.p.A.: *See*—
Boffelli, Pier C., 4,704,926, Cl. 82-36.00A.

BASF Aktiengesellschaft: *See*—
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,705,649, Cl. 260-402.000.
Baur, Richard; Oppenlaender, Knut; and Barthold, Klaus, 4,705,834, Cl. 525-540.000.
Buschmann, Ernst; Himmele, Walter; Eckhardt, Heinz; Ernst, Hansgeorg; Rademacher, Wilhelm; and Jung, Johann, 4,705,553, Cl. 71-76.000.
Nickels, Helmut; and Hackenberger, Alfred, 4,705,869, Cl. 549-317.000.
Warzelhan, Volker; Bachl, Robert; Ball, Wolfgang; Funk, Guido; and Laun, Martin, 4,705,835, Cl. 526-116.000.

BASF Corporation, Inmont Division: *See*—
Martin, Glenn E., 4,705,839, Cl. 528-49.000.

Basser, Theodore E.: *See*—
Wadhera, Anil K.; Tang, Alex K.; and Basser, Theodore E., 4,705,916, Cl. 174-35.0GC.

Bastenhof, Dirk. Fuel injection pump for an internal combustion engine comprising a device for adjusting the instant of injection fuel delivery. 4,705,006, Cl. 123-506.000.

Bateson, John E.: *See*—
DuVall, Dale R.; Bateson, John E.; Hewitt, Lew V.; and Hewitt, David P., 4,706,227, Cl. 367-96.000.

Bauer, Peter-Josef: *See*—
Mannle, Erik; and Bauer, Peter-Josef, 4,706,062, Cl. 338-172.000.

Baumker, Andrew J., Jr. Building truss clamp devices. 4,704,829, Cl. 52-127.200.

Baur, Bruce K., to Tektronix, Inc. Circuit arrangement for protecting a CRT and associated circuitry from damage due to arcing. 4,706,154, Cl. 361-56.000.

Baur, Richard; Oppenlaender, Knut; and Barthold, Klaus, to BASF Aktiengesellschaft. Crosslinked oxyalkylated polyalkylenepolyamines. 4,705,834, Cl. 525-540.000.

Bax, Anton M., to Smiths Industries Public Limited Company. AC controlled diode switch. 4,705,963, Cl. 307-257.000.

Baxter, Anthony G. W.; Bostock, Stephen B.; and Greenwood, David, to Imperial Chemical Industries PLC. Water-soluble triazine black

dyes from cellulose reactive groups and suitable for use in inks. 4,705,528, Cl. 8-641.000.

Bay, Otto. Arrangement including an inverter for feeding sheets of paper into an automatic zigzag folding machine. 4,705,496, Cl. 493-320.000.

Bayer Aktiengesellschaft: *See*—
Furstenwerth, Hauke; and Schundehutte, Karl H., 4,705,861, Cl. 548-178.000.
Grohe, Klaus; and Lammens, Robert, 4,705,789, Cl. 514-254.000.
Hammerschmidt, Erich; Behre, Horst; Blank, Heinz U.; and Mayer, Dietmar, 4,705,652, Cl. 260-512.00C.
Heller, Harold; Lange, Peter M.; and Martinola, Friedrich, 4,705,637, Cl. 210-670.000.
Hendricks, Udo W.; and Schmidt, Adolf, 4,705,889, Cl. 562-564.000.
Schriewer, Michael; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,705,788, Cl. 514-254.000.
Stammann, Gunter; Grolig, Johann; and Waldmann, Helmut, 4,705,843, Cl. 528-212.000.
Weber, Wilhelm; Sockel, Karl H.; Achtenberg, Theo; and Sattlegger, Hans, 4,705,826, Cl. 524-860.000.
Wehinger, Egbert; Meyer, Horst; and Benz, Ulrich, 4,705,794, Cl. 514-302.000.

Bayraktaroglu, Burhan, to Texas Instruments Incorporated. Periodic negative resistance microwave structures and amplifier and oscillator embodiments thereof. 4,706,041, Cl. 331-52.000.

BBC Brown, Boveri & Company, Limited: *See*—
Amstutz, Hermann; Kaufmann, Meinolph; Nehring, Jurgen; and Scheffer, Terry J., 4,705,359, Cl. 350-341.000.
Herzog, Kurt; and Schuler, Roland, 4,704,787, Cl. 29-596.000.

Beach, Stanley H., to Maytag Company, The. Gas distribution system for a range. 4,705,018, Cl. 126-39.00N.

Beach, Stanley H.; and Brangan, Richard W., to Maytag Company, The. Gas downdraft range with selectively interchangeable burners. 4,705,019, Cl. 126-39.00E.

Beach, Stanley H., to Maytag Company, The. Gas burner construction. 4,705,021, Cl. 126-41.00R.

Beachey, Edwin H., to University of Tennessee Research Corporation, The. Synthetic M proteins - streptococci type 6. 4,705,684, Cl. 424-88.000.

Bear, Richard W., to Epsco, Inc. Preformed soffits for interior construction. 4,704,833, Cl. 52-309.200.

Beard, Terry D. 3-D method and apparatus. 4,705,371, Cl. 352-86.000.

BECAP: *See*—
Ancelle, Eric J., 4,705,121, Cl. 175-325.000.

Bechtolsheimer, Hans-Heinrich: *See*—
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,705,649, Cl. 260-402.000.

Beck, Blaine E., to Advanced Medical Devices, Inc. Molded plastic gate valve and sealing means therefor. 4,705,073, Cl. 137-625.250.

Becker, Erwin; Ehrfeld, Wolfgang; and Hagmann, Peter, to Kernforschungszentrum Karlsruhe GmbH. Method for producing a spinning nozzle plate. 4,705,605, Cl. 204-11.000.

Becker, Manfred: *See*—
Klotzer, Sieghart; Mucke, Bruno; Mahlberg, Gunther; and Becker, Manfred, 4,705,747, Cl. 430-550.000.

Becker, Michael W.; Stevenson, John S.; and Najjar, Mitri S., to Texaco, Inc. Partial oxidation of vanadium-containing heavy liquid hydrocarbonaceous and solid carbonaceous fuels. 4,705,536, Cl. 48-197.00R.

Becker, Michael W.: *See*—
Najjar, Mitri S.; Becker, Michael W.; and Muan, Arnulf, 4,705,539, Cl. 48-197.00R.

Becton, Dickinson and Company: *See*—
DiPisa, Joseph A., Jr., 4,705,517, Cl. 623-12.000.
Recktenwald, Diether J.; Kerndt, Rickie S.; Loken, Michael R.; and Chen, Chia H., 4,704,891, Cl. 73-1.00R.

Bedekovic, Davor; and Fletcher, Ian J., to Ciba-Geigy Corporation. Recording material containing chromogenic 3,3-bisindolyl-4-azaphthalides. 4,705,776, Cl. 503-220.000.

Bednarz, Jurgen: *See*—
Reichert, Karl-Heinz; Schoeppel, Wolfgang; Ewangelidis, Stawros; Bednarz, Jurgen; and Leute, Ulrich, 4,705,648, Cl. 252-512.000.

Beebe, Cedric H.; McDavid, Larry S.; and Pawlowski, Michael, to Sensormedics Corporation. Apparatus for deplating cutaneous gas sensors. 4,705,617, Cl. 204-402.000.

Beebe, James C., to Eagle-Picher Industries, Inc. Apparatus and method for imposing a desired average radial force on a tire. 4,704,900, Cl. 73-146.000.

Beecham Group p.l.c.: *See*—
Hadley, Michael S.; and King, Francis D., 4,705,858, Cl. 546-112.000.

Behs, Johannes G.; Dreyfus, Russell W.; and Rubloff, Gary W., to International Business Machines Corporation. Noncontact dynamic tester for integrated circuits. 4,706,018, Cl. 324-158.00R.

Behre, Horst: *See*—
Hammerschmidt, Erich; Behre, Horst; Blank, Heinz U.; and Mayer, Dietmar, 4,705,652, Cl. 260-512.00C.

Beiley, Mark J., to Teledyne Linair Engineering. Tube fitting. 4,705,302, Cl. 285-47.000.

Beitner, Shlomo, to Vapor Corporation. Thermoelectric cooler. 4,704,870, Cl. 62-3.000.

Belfor, Michael E.: *See*—
Bohl, Walter L., Jr.; and Belfor, Michael E., 4,705,488, Cl. 446-393.000.

Bell, Cecil R., Jr.: *See*—
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,704,976, Cl. 112-262.200.

Bell Communications Research, Inc.: *See*—
Cheng, Steven S., 4,705,350, Cl. 350-96.160.
Sincoskie, Walter D., 4,706,080, Cl. 340-825.020.

Bell, Donald G.: *See*—
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,704,976, Cl. 112-262.200.

Bell & Howell Company: *See*—
Bowles, Myron A., 4,705,157, Cl. 198-405.000.

Bell, Marl J.: *See*—
Millerd, Donald L.; and Bell, Marl J., 4,705,998, Cl. 318-444.000.

Bell, Robert L., to Fisher Dynamics Corporation. Seat recliner mechanism with spring coil actuator and creep eliminator feature. 4,705,319, Cl. 297-362.000.

Bellini, Francesco: *See*—
Sestanj, Kazimir; Abraham, Nedumparambil A.; Bellini, Francesco; and Treasurywala, Adi, 4,705,882, Cl. 560-10.000.

Bellofram Corporation: *See*—
St. Laurent, Wilfred; and Athanassiu, Christos, 4,705,458, Cl. 417-46.000.

Belszek, Henry: *See*—
Murphy, Michael; and Belszek, Henry, 4,704,827, Cl. 52-34.000.

Beltz, Robert J.; and Dankoff, Joseph D. High speed steel sintering powder made from reclaimed grinding sludge and objects sintered therefrom. 4,705,565, Cl. 75-235.000.

Belusa, Manfred L., to Belvin Properties Limited. Monitoring of fluid flow. 4,705,457, Cl. 417-22.000.

Belvin Properties Limited: *See*—
Belusa, Manfred L., 4,705,457, Cl. 417-22.000.

Bene nee Horvath, Magdolna: *See*—
Madi-Szabo, Laszlo ; Morvai, Margit; Horvath nee Feher, Eva; Jansco, Sandor; Tamasi, Piroska; Kovacs, Istvan; Kiss nee Loss, Ilona Maria; Bacsa, Gyorgy; Kubala nee Papp, Maria; and Bene nee Horvath, Magdolna, 4,705,779, Cl. 514-27.000.

Benetesu, Christian; and Guerard, Norbert, to Champion Spark Plug Europe S.A. Wiper blade. 4,704,762, Cl. 15-250.420.

Benneche, Tore; and Undheim, Kjell, to Nyegaard & Co. A/S. Substituted pyrimidin-2-ones and the salts thereof. 4,705,791, Cl. 514-274.000.

Bennett, Ralph H., to Avdel Limited. Nosepiece for apparatus for installing fasteners. 4,705,201, Cl. 227-55.000.

Bennett, Therman B. Tooth profile sensing instrument. 4,704,802, Cl. 33-556.000.

Benninger AG: *See*—
Bossart, Erwin; and Hasler, Hans, 4,705,232, Cl. 242-150.00R.

Benoit, Albert J.; Boden, Dudley M.; Decker, David G.; Kishner, Stanley J.; and Van Arsdell, Robert D., to Kollmorgen Technologies Corporation. Color printing control using halftone control areas. 4,706,206, Cl. 364-526.000.

Benson, Arthur: *See*—
Levendusky, Thomas L.; Benson, Arthur; and Lunden, Richard W., 4,705,927, Cl. 219-10.55E.

Benz, Ulrich: *See*—
Wehinger, Egbert; Meyer, Horst; and Benz, Ulrich, 4,705,794, Cl. 514-302.000.

Beppu, Osamu: *See*—
Endo, Yasuhisa; Mizuhara, Shuhei; Murakami, Satoshi; Beppu, Osamu; and Toshioka, Saiji, 4,704,997, Cl. 123-198.0DB.

Bercu, Iancu, to State of Israel, Ministry of Defence, Military Industries of Israel, The. Semi-automatic pistol. 4,704,944, Cl. 89-132.000.

Berendt, Hans-Ulrich: *See*—
Abel, Heinz; Schafer, Paul; and Berendt, Hans-Ulrich, 4,705,525, Cl. 8-555.000.
Abel, Heinz; Schafer, Paul; and Berendt, Hans-Ulrich, 4,705,526, Cl. 8-555.000.

Berfield, Robert C., to Shop-Vac Corporation. Vehicle with readily mountable steering handle. 4,705,282, Cl. 280-47.37R.

Berger, Friedrich: *See*—
Fleischer, Klaus; Gohler, Peter; Mangler, Rolf; Reuther, Christian; Schingnitz, Manfred; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir; Fedotov, Vasilij; and Rodionov, Boris, 4,704,971, Cl. 110-264.000.

Bergstrom, Arne. Image monochromator. 4,705,396, Cl. 356-332.000.

Bergwerksverband GmbH: *See*—
Boing, Rolf; Frase, Dietmar; and Noeske, Manfred, 4,704,895, Cl. 73-104.000.

Bernadic, Thomas J.: *See*—
Patterson, John H.; and Bernadic, Thomas J., 4,705,434, Cl. 407-114.000.

Berndt, Lawrence. Compression seals in a double hung style window. 4,704,821, Cl. 49-446.000.

Berning, Peter H.; and Phillips, Roger W., to Optical Coating Laboratory, Inc. Thin film optically variable article and method having gold to green color shift for currency authentication. 4,705,300, Cl. 283-91.000.

Berning, Peter H.; and Phillips, Roger W., to Optical Coating Laboratory, Inc. Thin film optical variable article having substantial color shift with angle and method. 4,705,356, Cl. 350-166.000.

Bernstein, Jonathan J.; Koger, T. Bruce; and Chanley, Charles S., to Motorola, Inc. Carbon film oxidation for free-standing film formation. 4,705,659, Cl. 264-29.600.

Berry, Timothy E.: *See*—
Greider, C. Austin; and Berry, Timothy E., 4,704,847, Cl. 56-10.500.

Bertoglio, Ottavio: *See*—
Astegiano, Luciano; Bertoglio, Ottavio; Bosco, Fulvio; de Bosio, Alfredo; Franco, Dario; Lampiano, Piero; Melle, Antonio; and Rosboch, Luciano, 4,706,270, Cl. 379-2.000.

Bertram, Heidrun-Leonore: *See*—
Tanner, Herbert; Bertram, Heidrun-Leonore; Richter, Reinhard; and Spindler, Manfred, 4,705,689, Cl. 426-2.000.

Bertus, Brent J.: *See*—
Coombs, Daniel M.; Cymbaluk, Ted H.; Bertus, Brent J.; and Kukes, Simon G., 4,705,768, Cl. 502-213.000.

Besson, Raymond; Delaite, Richard; Genestier, Gerard; Maitre, Pierre; Renard, Georges; Thiebaud, Daniel; and Valentin, Jean-Pascal, to Ecole Nationale Superieure de Mecanique et des Microtechniques. Device for supporting a piezoelectric resonator inside a casing. 4,705,982, Cl. 310-356.000.

Beste, Achim: *See*—
Eisenberg, Helmut; von Heimburg, Henning; Weber, Friedhelm; Beste, Achim; and Vorderbruck, Dirk, 4,705,215, Cl. 238-349.000.

Beyer, Karl-Heinz: *See*—
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,705,649, Cl. 260-402.000.

Beyth, Werner W.: *See*—
Seliman, Leonard R.; Embury, Janon F., Jr.; and Beyth, Werner W., 4,704,966, Cl. 102-334.000.

Bianchi, Giorgio: *See*—
Nardi, Dante; Leonardi, Amedeo; Graziani, Gabriele; and Bianchi, Giorgio, 4,705,797, Cl. 514-356.000.

Bianchini, William L.; and Duclos, Gary P., to Highland Import Corporation. Shoe having a rigid back part and flexible forepart. 4,704,808, Cl. 36-102.000.

Biere, Helmut, to Schering Aktiengesellschaft. Process for producing β-carboline derivatives. 4,705,856, Cl. 546-21.000.

Biere, Helmut, to Schering Aktiengesellschaft. Indole derivatives, process for producing them and their use as intermediates. 4,705,857, Cl. 546-65.000.

Billington, Donald G.: *See*—
Gordon, Alan J.; Billington, Donald G.; Evans, Robert; and Bowman, David J., 4,705,630, Cl. 210-361.000.

Bingley, John D.: *See*—
Callen, Patrick J.; Bingley, John D.; and Newell, Richard A., 4,706,010, Cl. 323-225.000.

Binzer, Norbert: *See*—
Guido, Jurgen; and Binzer, Norbert, 4,705,306, Cl. 285-332.000.

Bio-Rad Laboratories, Inc.: *See*—
Chu, Daniel Y. M., 4,705,056, Cl. 134-111.000.

Biogal Gyogyszergyar of Debrecen and Alkaloida Vegyeszeti Gyar of Tiszavasvari: *See*—
Madi-Szabo, Laszlo ; Morvai, Margit; Horvath nee Feher, Eva; Jansco, Sandor; Tamasi, Piroska; Kovacs, Istvan; Kiss nee Loss, Ilona Maria; Bacsa, Gyorgy; Kubala nee Papp, Maria; and Bene nee Horvath, Magdolna, 4,705,779, Cl. 514-27.000.

Bipore, Inc.: *See*—
Kocak, Nuri, 4,705,511, Cl. 604-282.000.

Birk, John; Breu, Heinz; Gong, William; Morehouse, Charles C.; and Liebes, Sidney, Jr., to Hewlett-Packard Company. System for sensing and forming objects such as leads of electronic components. 4,705,081, Cl. 140-147.000.

Birnstiel, Willi: *See*—
Klos, Klaus-Peter; Lindemann, Karl-Heinz; and Birnstiel, Willi, 4,705,576, Cl. 148-6.200.

Bisbing, Robert H., to Southco, Inc. Draw pull latch. 4,705,308, Cl. 292-108.000.

Black, James B., to GTE Communication Systems Corporation. Arrangement for transferring data to a centrex. 4,706,276, Cl. 379-242.000.

Black, James B., to GTE Communications Systems. Interface circuit for transmitting command codes to an attendant console. 4,706,277, Cl. 379-242.000.

Black, James B., to GTE Communication Systems. Interface circuit for transmitting keycodes to a CENTREX. 4,706,278, Cl. 379-242.000.

Black, James B., to GTE Communication Systems Corporation. Arrangement for initializing a CENTREX console interface circuit. 4,706,279, Cl. 379-279.000.

Black, Stephen J.; Hitzigrath, Richard; Rosenblatt, Arnold; and Grundy, Douglas H., to Grumman Aerospace Corp. Fuel/auxiliary oil thermal management system. 4,705,100, Cl. 165-40.000.

Blackmer, David E.; and Townsend, James H., Jr., to Kintek, Inc. Stereo generator. 4,706,287, Cl. 351-17.000.

Blair, John J., to Dentsply Research & Development Corp. Method and apparatus to produce artificial dentures. 4,705,476, Cl. 433-171.000.

Blank, Heinz U.: *See*—
Hammerschmidt, Erich; Behre, Horst; Blank, Heinz U.; and Mayer, Dietmar, 4,705,652, Cl. 260-512.00C.

Blatter, Max, to Flowtec AG. Method for compensating interference voltages in the electrode circuit in magnetic-inductive flow measurement. 4,704,908, Cl. 73-861.170.

Blytas, George C.; and Trogus, Frank J., to Shell Oil Company. Reduction of sodium in coal by water wash and ion exchange with a weak electrolyte. 4,705,530, Cl. 44-1.00R.

Blytas, George C., to Shell Oil Company. Reduction of sodium in coal by water wash followed by ion exchange within a pipeline. 4,705,531, Cl. 44-1.00R.

Blytas, George C.: *See*—
Fong, Howard L.; Diaz, Zaida; and Blytas, George C., 4,705,676, Cl. 423-567.00A.

Boast, Carl A., to Giba-Geigy Corporation. Method of treating cerebral ischemia using 4-(phosphono substituted lower alkyl or lower alkenyl)piperazine-2-carboxylic acids and salts, esters and amides thereof. 4,705,781, Cl. 514-85.000.

Boden, Dudley M.: *See*—
Benoit, Albert J.; Boden, Dudley M.; Decker, David G.; Kishner, Stanley J.; and Van Arsdell, Robert D., 4,706,206, Cl. 364-526.000.

Bodewein, Jakob, to Jagenberg AG. Method and apparatus for removing edge strips from material webs of paper, cardboard or the like. 4,704,930, Cl. 83-24.000.

Boeckmann, Hugo; and Van Erden, Donald L., to Minigrip, Inc. Method and appartus for handling reclosable wrapper sheet material. 4,704,842, Cl. 53-450.000.

Boehringer Ingelheim Vetmedica GmbH: *See*—
Kern, Otto; Wilhelm, Franz; and Salamon, Ernst, 4,705,803, Cl. 514-450.000.

Boehringer Mannheim GmbH: *See*—
Willnow, Peter; Lehmann, Paul; Ziegenhorn, Joachim; and Wahlefeld, August W., 4,705,749, Cl. 435-15.000.

Boeing Company, The: *See*—
Archung, Ralph, 4,704,865, Cl. 60-405.000.
Cross, Dan A., 4,704,775, Cl. 29-33.00M.
Rudolph, Peter K. C., 4,705,236, Cl. 244-90.00R.

Boelema, Eltjo: *See*—
Meijer, John; Westmijze, Hans; and Boelema, Eltjo, 4,705,888, Cl. 560-302.000.

Boesten, Wilhelmus H. J.; and Cals, Maria J. H., to Stamicarbon B.V. Process for the enzymatic hydrolysis of D-α-amino-acid amides. 4,705,752, Cl. 435-106.000.

Boffelli, Pier C., to Baruffaldi Frizioni S.p.A. Turret for an automatic lathe. 4,704,926, Cl. 82-36.00A.

Boger, Joshua S.; and Payne, Linda S., to Merck & Co., Inc. Process for preparing alpha,omega-diamino acids. 4,705,892, Cl. 562-562.000.

Boginsky, Vladimir P.: *See*—
Kostylev, Alexandr D.; Danilov, Boris B.; Smolyanitsky, Boris N.; Boginsky, Vladimir P.; Kogan, David I.; Smirnov, Oleg V.; and Saveliev, Vyacheslav N., 4,705,119, Cl. 175-92.000.

Bogusch, Eugene D. Nitrification with sludge reaeration and ammonia enrichment. 4,705,633, Cl. 210-614.000.

Bohl, Walter L., Jr.; and Belfor, Michael E., to Kenner Parker Toys Inc. Eye assembly for toy dolls. 4,705,488, Cl. 446-393.000.

Boing, Rolf; Frase, Dietmar; and Noeske, Manfred, to Bergwerksverband GmbH. Method and device for monitoring roller drilling tools. 4,704,895, Cl. 73-104.000.

Bokmiller, David J.; and Heck, Samuel C., to Sani-Fresh International, Inc. Cleaning system having cleaning fluid capsule. 4,705,420, Cl. 401-145.000.

Boliden Aktiebolag: *See*—
Hedlund, Martin L., 4,705,562, Cl. 75-83.000.

Boling, Monte J., to Anderson Machine Works. Belt feeder for orienting and transporting round symmetrical parts. 4,705,156, Cl. 198-392.000.

Boll, Hans-Joachim, to Wagner International AG; and J. Wagner GmbH. Control circuit for airless spray gun. 4,705,995, Cl. 318-129.000.

Bollman, Clifford J. Multi-adjustable, multi-functional work station system. 4,705,327, Cl. 312-312.000.

Bomba, Frank C.; and Jenkins, Stephen R., to Digital Equipment Corporation. Retry mechanism for releasing control of a communications path in digital computer system. 4,706,190, Cl. 364-200.000.

Bona, Cesare, to Ages Italia S.p.A. Print assembly for magnetic and clear printing magnetic cards and the like. 4,704,960, Cl. 101-93.120.

Bonasso, Samuel G. Tension arch structure. 4,704,754, Cl. 14-20.000.

Bondeson, Anders: *See*—
Tran, Minh Q.; and Bondeson, Anders, 4,705,988, Cl. 315-4.000.

Bondon, Lewis A. High voltage flexible cable for pressurized gas insulated transmission line. 4,705,914, Cl. 174-28.000.

Bonfield, John H.; and Ulmer, Harry E., to Allied Corporation. Vapor phase synthesis of hexafluoroisobutylene. 4,705,904, Cl. 570-142.000.

Bonhomme, Francois R. Processes for fabricating female electric connector elements and female connector elements thus obtained. 4,705,336, Cl. 439-597.000.

Borden, Inc.: *See*—
Pouget, Jacques; Lipovac, Vincent; and de Mauduit, Yves, 4,705,586, Cl. 156-242.000.

Borders, Donald B.: *See*—
Carter, Guy T.; Greenstein, Michael; Goodman, Joseph J.; Borders, Donald B.; Maiese, William M.; and Testa, Raymond T., 4,705,688, Cl. 424-122.000.

Borg-Warner Corporation: *See*—
Kelly, Robert R., 4,706,063, Cl. 340-60.000.

Borodulin, German; Persidsky, Maxim; and Shkolnik, Alexander. Expandable urethral bougies. 4,705,029, Cl. 128-43.000.

Bosco, Fulvio: *See—*
Astegiano, Luciano; Bertoglio, Ottavio; Bosco, Fulvio; de Bosio, Alfredo; Franco, Dario; Lampiasso, Piero; Melle, Antonio; and Rostoch, Luciano, 4,706,270, Cl. 379-2.000.
Bossart, Erwin; and Hasler, Hans, to Benninger AG. Yarn tensioning device. 4,705,232, Cl. 242-150.00R.
Bosshard, Ernst: *See—*
Liebl, Rudolf; and Bosshard, Ernst, 4,705,469, Cl. 425-117.000.
Bostock, Stephen B.: *See—*
Baxter, Anthony G. W.; Bostock, Stephen B.; and Greenwood, David, 4,705,528, Cl. 8-641.000.
Boston Digital Corporation: *See—*
Linn, Thomas D., 4,705,187, Cl. 220-333.000.
Bottos, Roberto: *See—*
Nerli, Giovanni; Grego, Francesco; Bottos, Roberto; and Ferro, Francesco, 4,704,859, Cl. 57-401.000.
Bouiller, Jean G.; and Soligny, Marcel R., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Turbomachine casing with containment structure intended to contain fractured rotating parts. 4,705,454, Cl. 415-197.000.
Boulitrop, Francois: *See—*
Szydlo, Nicolas; Boulitrop, Francois; and Kasprzak, Rolande, 4,704,784, Cl. 437-41.000.
Bourg, Robert A., to Amoco Corporation. Tubing assembly. 4,705,111, Cl. 166-277.000.
Bourn, Ronald L. Ram wing surface effect vehicle. 4,705,234, Cl. 244-12.100.
Bowles, Myron A., to Bell & Howell Company. Article turning assembly. 4,705,157, Cl. 198-405.000.
Bowman, David J.: *See—*
Gordon, Alan J.; Billington, Donald G.; Evans, Robert; and Bowman, David J., 4,705,630, Cl. 210-361.000.
Boyles, Paul W. Arterial catheter means. 4,705,507, Cl. 604-101.000.
Bradbury, David: *See—*
Wood, Christopher J.; Bradbury, David; Swan, Timothy; Segal, Michael G.; and Sellers, Robin M., 4,705,573, Cl. 134-3.000.
Brand, Larry M.; and McDaniel, Harry C., to Procter & Gamble Co., The. Weighting oil substitutes. 4,705,690, Cl. 426-590.000.
Brandes, Gunter; Neier, Wilhelm; and Webers, Werner, to Deutsche Texaco Aktiengesellschaft. Process for treating a core halogenated strongly acidic cation exchange catalyst. 4,705,808, Cl. 521-30.000.
Brangan, Richard W.: *See—*
Beach, Stanley H.; and Brangan, Richard W., 4,705,019, Cl. 126-39.00E.
Brannstrom, Roine, to Asea Stal Aktiebolag. Pneumatic transportation system with a material feeder. 4,705,433, Cl. 406-63.000.
Brauer, Melvin; Downey, William J.; and Naughton, Frank C., to CasChem, Inc. Process for using ricinoleate plasticized polyurethanes for sealing electrical devices. 4,705,723, Cl. 428-375.000.
Brauer, Melvin: *See—*
Downey, William J.; Brauer, Melvin; and Chao, Jerry Chien-I, 4,705,724, Cl. 428-375.000.
Braun Aktiengesellschaft: *See—*
Schwarz, Gerhard, 4,706,009, Cl. 320-22.000.
Braun, Anton. Bounce chambers for multi-cylinder linear engine compressors. 4,705,460, Cl. 417-266.000.
Braymand, Robert, to Societe Nouvelle Baele Gangloff. Pasteurization apparatus. 4,704,958, Cl. 99-470.000.
Breat, Francois: *See—*
Lauzier, Rene; Rollin, Jean; Choquelle, Jean; Dumas, Gerard; Breat, Francois; Rousson, Maurice; and Defour, Paule, 4,705,286, Cl. 280-281.00R.
Brekle, Axel: *See—*
Lautenschlager, Hans-Heiner; Parnham, Michael J.; Leyck, Sigurd; Winkelmann, Johannes; and Brekle, Axel, 4,705,802, Cl. 514-438.000.
Bremer, Hans-Joachim: *See—*
Haarmann, Walter; and Bremer, Hans-Joachim, 4,705,489, Cl. 464-69.000.
Brennstoffinstitut Freiberg: *See—*
Fleischer, Klaus; Gohler, Peter; Mangler, Rolf; Reuther, Christian; Schingnitz, Manfred; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir; Fedotov, Vasilij; and Rodionov, Boris, 4,704,971, Cl. 110-264.000.
Brett, J. Ford: *See—*
Warren, Tommy M.; Winters, Warren J.; and Brett, J. Ford, 4,705,117, Cl. 175-65.000.
Breu, Heinz: *See—*
Birk, John; Breu, Heinz; Gong, William; Morehouse, Charles C.; and Liebes, Sidney, Jr., 4,705,081, Cl. 140-147.000.
Bricaud, Herve: *See—*
L'Henaff, Patrick; and Bricaud, Herve, 4,706,164, Cl. 361-382.000.
Bricker, Jeffery C.; and Staehle, Bruce E., to UOP Inc. Mercaptan extraction process. 4,705,620, Cl. 208-206.000.
Brien, Andre . Portable time piece with light diffuser. 4,705,407, Cl. 368-227.000.
Briggs, Jerald E.; and Pfutzenreuter, Henry, to American Can Company. Multi-laminate structure containing a scrap layer and containers made therefrom. 4,705,708, Cl. 428-35.000.
Brigham Young University: *See—*
Stout, W. Douglas, 4,705,284, Cl. 280-242.0WC.
Brimhall, Owen D.: *See—*
Baker, Charles D.; Brimhall, Owen D.; and Galway, Charles R., 4,705,518, Cl. 623-14.000.
British Petroleum Company p.l.c., The: *See—*
Alper, Howard; and Smith, David J. H., 4,705,880, Cl. 558-257.000.
Brophy, John H.; and Nock, Anthony, 4,705,906, Cl. 585-262.000.
Moore, John, 4,705,314, Cl. 294-115.000.
British Telecommunications: *See—*
Haigh, John; and Aylett, Martin R., 4,705,593, Cl. 156-635.000.
Britton, James N., to Wayne Graham & Associates International, Inc. Subsea clamping apparatus. 4,705,331, Cl. 439-387.000.
Brocker, Heinz: *See—*
Keller, Heinz; Brocker, Heinz; and Lehner, Martin, 4,705,608, Cl. 204-28.000.
Brockman, David M. Special purpose peripheral circuit and method of connecting the same to a computer. 4,706,189, Cl. 364-200.000.
Brodbeck, Howard D.: *See—*
Burckhardt, Klaus A.; and Brodbeck, Howard D., 4,705,574, Cl. 134-17.000.
Brodell, Robert F.: *See—*
Dennison, William T.; and Brodell, Robert F., 4,704,862, Cl. 60-226.200.
Broderna Holmbergs Fabriks AB: *See—*
Orje, Christer H., 4,704,771, Cl. 24-574.000.
Brons, Glen B.: *See—*
Siskin, Michael; Brons, Glen B.; and Green, Gary S., 4,705,622, Cl. 208-289.000.
Brooks, Gary T., to Standard Oil Company (Indiana). Injection moldable amide-imide copolymers containing polyetherimides. 4,705,832, Cl. 525-436.000.
Brophy, John H.; and Nock, Anthony, to British Petroleum Company, p.l.c., The. Selective hydrogenation of acetylene. 4,705,906, Cl. 585-262.000.
Bross, Klaus, to Paul Marienfeld KG. Process for the production of slides with delimited reaction fields, and the slides produced by the process. 4,705,705, Cl. 428-13.000.
Brother Kogyo Kabushiki Kaisha: *See—*
Asakura, Hideo, 4,705,416, Cl. 400-144.200.
Nomura, Etsuzo; Kozawa, Tetsuo; and Sakakibara, Yasuo, 4,704,978, Cl. 112-275.000.
Takagi, Kazuhiko, 4,706,125, Cl. 358-256.000.
Brown, Alan S.: *See—*
Mueller, Peter R.; Brown, Alan S.; Tolkoff, Marc J.; and Crawford, Frank B., 4,705,040, Cl. 128-334.00R.
Brown, Arthur K., Jr., to Allied Corporation. Hydraulic brake booster with cam and lever ratio changer. 4,704,867, Cl. 60-554.000.
Brown, Dwight C. Inflatable beverage insulator. 4,705,085, Cl. 220-400.000.
Brown International Corporation: *See—*
Rohm, Robert F.; and Bushman, Ronald C., 4,705,055, Cl. 134-57.00R.
Brown, Melvin H.: *See—*
Hornack, Thomas R.; and Brown, Melvin H., 4,705,106, Cl. 165-179.000.
Brown, Omar L.: *See—*
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Wynn, David K.; and Gregg, James R., 4,704,887, Cl. 72-347.000.
Brown, Paul W.: *See—*
Grimes, John W., II; Jennings, Hamlin; and Brown, Paul W., 4,705,949, Cl. 250-440.100.
Brown, Will C.: *See—*
Zogg, Robert A.; Robertson, Gerald F.; and Brown, Will C., 4,705,103, Cl. 165-110.000.
Brownlee, Michael: *See—*
Cerami, Anthony; Pongor, Sandor; and Brownlee, Michael, 4,705,845, Cl. 530-305.000.
Brubakken, Gardner G.; and Mohammadian, Mehdi. Self-contained bathroom unit. 4,704,747, Cl. 4-321.000.
Bruckner Trockentechnik GmbH & Co. KG: *See—*
Gresens, Harry, 4,704,806, Cl. 34-54.000.
Brudney, Norman: *See—*
Maes, Daniel; and Brudney, Norman, 4,705,681, Cl. 424-70.000.
Bruggemann, Horst, to Deutsche Asphalt GmbH. Method and apparatus for processing mixed asphalt material utilizing broken-up used asphalt. 4,705,404, Cl. 366-7.000.
Bruner, Maurice M.: *See—*
Yates, Chester R.; and Bruner, Maurice M., 4,704,752, Cl. 5-247.000.
Brunet, Henri; Mabru, Michel; and Gastaud, Michel, to Compagnie Generale d'Electricite. Gas laser generator and method of operating same. 4,706,257, Cl. 372-88.000.
Bruno, Gmur, to Gebruder Buhler AG. Method and apparatus for closing bags and a plant for bagging bulk materials. 4,704,845, Cl. 53-482.000.
Bruns, Helmut; Freiheit, Artur; and Kolley, Arnold, to Erno Raunfahrttechnik GmbH. Fuel collection in surface tension fuel tanks. 4,705,546, Cl. 55-182.000.
Bruns, Robert F., to Warner-Lambert Company. Adenosine receptor assay and kit. 4,705,758, Cl. 436-504.000.
Buckanin, Richard S., to Minnesota Mining and Manufacturing Company. Catalysts for the curing of a water-curable isocyanate-functional prepolymer. 4,705,840, Cl. 528-53.000.
Buckingham, John S., to Minnesota Mining and Manufacturing Company. Device protective apparatus. 4,706,161, Cl. 361-220.000.
Budrikis, Zigmantas L.; Hatamian, Mehdi; Kubik, Peter S.; and Netravali, Arun N., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Pressure-sensitive light pen. 4,705,942, Cl. 250-227.000.
Buisine, Paul H.; and Dancer, Paul, to Dowell Schlumberger Incorporated. Method of observing the pumping characteristics of a positive displacement pump. 4,705,459, Cl. 417-53.000.

Burckhardt, Klaus A.; and Brodbeck, Howard D., to MG Industries, Inc. Debonding process for removing non-metallic coatings from metal hangers. 4,705,574, Cl. 134-17.000.

Burguette, Mario D.; and Foss, George D., to Minnesota Mining and Manufacturing Company. Method of coating magnetic recording media with perfluoropolyether compositions which are soluble in non-fluorinated solvents. 4,705,699, Cl. 427-54.100.

Burke, Peter A.; Duering, Walter; and Gut, Martin, to Kiwi Brands, Inc. Safety cap for containers of liquids. 4,705,181, Cl. 215-220.000.

Burkhardt, Charles E.: *See—*
Lin, Kou C.; Burkhardt, Charles E.; and Sheppard, Harry R., 4,705,578, Cl. 148-108.000.

Burki, Peter: *See—*
Schaub, Heiner; and Burki, Peter, 4,705,376, Cl. 354-298.000.

Burlington Industries, Inc.: *See—*
Hussamy, Samir, 4,705,523, Cl. 8-490.000.
Hussamy, Samir, 4,705,527, Cl. 8-558.000.

Burnham, Robert D.: *See—*
Thornton, Robert L.; and Burnham, Robert D., 4,706,255, Cl. 372-50.000.

Burns, Richard H. Foldable utility cart with auxiliary support carriage. 4,705,280, Cl. 280-40.000.

Burr, Kenneth J.; Smith, Laurence S.; and Hazelden, David, to English Clays Lovering Pochin & Company, Limited. Measurement of physical properties of the solid component of a slurry. 4,704,899, Cl. 73-61.00R.

Burroughs Wellcome Co.: *See—*
Leighton, Harry J., 4,705,854, Cl. 544-41.000.

Buschmann, Ernst; Himmele, Walter; Eckhardt, Heinz; Ernst, Hansgeorg; Rademacher, Wilhelm; and Jung, Johann, to BASF Aktiengesellschaft. Method of reducing plant growth height using phenylalkylmorpholines. 4,705,553, Cl. 71-76.000.

Bushman, Ronald C.: *See—*
Rohm, Robert F.; and Bushman, Ronald C., 4,705,055, Cl. 134-57.00R.

Bussan, Marc R.; and Winternheimer, Sylvester A., to Whirlpool Corporation. Lighting system for appliance dials. 4,706,169, Cl. 362-26.000.

Butler, James L., Jr.: *See—*
Sheldon, Sidney; and Butler, James L., Jr., 4,705,513, Cl. 604-361.000.

Buttazzoni, Bernard; Leseur, Philippe; Thebault, Jacques; and Constant, Georges, deceased (by Constant, Marie-Josette, Francoise Constant, Philippe Constant, executors), to Societe Europeenne de Propulsion. Process for making bioactive coatings on osseous prostheses, and prostheses thus obtained. 4,705,694, Cl. 427-2.000.

Butwell, Kenneth F.: *See—*
Capobianco, Paul J.; Butwell, Kenneth F.; and Kossakowski, Edward J., 4,705,673, Cl. 423-229.000.

Byers, Gary W., to Eastman Kodak Company. Process for reheating dye-receiving element containing stabilizer. 4,705,521, Cl. 8-471.000.

Byers, Gary W., to Eastman Kodak Company. Alkolxy derivative stabilizers for dye-receiving element used in thermal dye transfer. 4,705,522, Cl. 8-471.000.

Cable Electric Products, Inc.: *See—*
Schwartz, Frederic W., 4,705,342, Cl. 439-650.000.

Cacioppo, Joseph C.; Wuerzer, Donald R.; and Piglia, Peter J., to National Machine Company, Inc. Slip ring assembly and method of manufacture. 4,705,976, Cl. 310-232.000.

Cadaureille, Gerard: *See—*
Frizot, Alain; Cadaureille, Gerard; Lalere, Jean C.; and Machuron, Jean-Yves, 4,704,801, Cl. 33-502.000.

Cain, J. Bradley; and Farnworth, Brian, to Canada, Her Majesty the Queen in right of. Tent liners/walls for cold weather operations. 4,705,717, Cl. 428-252.000.

Calabrese, Peter J.; and Pismennaya, Galina, to Olin Hunt Specialty Products Inc. Method of making a lithographic printing plate, printing plates made by the method, and the use of such printing plates to make lithographic prints. 4,705,696, Cl. 427-14.100.

Cale, Albert D., Jr., to A. H. Robins Company, Inc. Fused aromatic oxazepinones, thiazepinones, diazepinones and sulfur analogs thereof. 4,705,853, Cl. 540-490.000.

Calenda, Ciro: *See—*
DeFilippis, Pietro; Calenda, Ciro; and Notaro, Giuseppe, 4,706,152, Cl. 361-32.000.

Calgon Corporation: *See—*
McCurdy, John W.; and Danyliw, Brian H., 4,705,672, Cl. 423-3.000.

Callahan, James L.: *See—*
Desmond, Michael J.; Pepera, Marc A.; and Callahan, James L., 4,705,675, Cl. 423-326.000.

Callen, Patrick J.; Bingley, John D.; and Newell, Richard A., to RCA Corporation. Linear solar array voltage control system. 4,706,010, Cl. 323-225.000.

Cals, Maria J. H.: *See—*
Boesten, Wilhelmus H. J.; and Cals, Maria J. H., 4,705,752, Cl. 435-106.000.

Cameron Iron Works, Inc.: *See—*
Baker, Gerald S., 4,705,062, Cl. 137-315.000.

Cameron, Murray C. Hydroponic growing system and stackable modular components thereof. 4,704,818, Cl. 47-62.000.

Camino Laboratories, Inc.: *See—*
Bailey, Wilber H., 4,705,047, Cl. 128-672.000.

Campbell, Jack J.: *See—*
Faroudja, Yves C.; and Campbell, Jack J., 4,706,112, Cl. 358-31.000.

Campbell, William P., III. Amorphous silicon devices and method of producing. 4,705,913, Cl. 136-258.000.

Canada, Her Majesty the Queen in right of: *See—*
Cain, J. Bradley; and Farnworth, Brian, 4,705,717, Cl. 428-252.000.

Canales-Santos, Enrique; Carro-de-la-Fuente, Guillermo; and Ruiz-Ontiveros, Saul R., to Vitro Tec Fideicomiso. Process for providing a thermically homogeneous flow of molten glass. 4,705,550, Cl. 65-32.000.

Canon Kabushiki Kaisha: *See—*
Baba, Takeshi; and Suda, Shigeyuki, 4,706,124, Cl. 358-227.000.
Eguchi, Ken; Nishimura, Yukuo; Haruta, Masahiro; Matsuda, Hiroshi; Hirai, Yutaka; and Nakagiri, Takashi, 4,705,403, Cl. 356-319.000.
Ikemori, Keiji, 4,705,363, Cl. 350-427.000.
Itabashi, Satoshi; Kawakami, Soichiro; Terada, Katsunori; Suzuki, Hideyuki; Furushima, Teruhiko; and Fukaya, Masaki, 4,705,598, Cl. 156-643.000.
Kimura, Shinichi, 4,706,078, Cl. 340-735.000.
Kohno, Michio, 4,705,940, Cl. 250-201.000.
Maeda, Masaya, 4,706,139, Cl. 360-71.000.
Miyawaki, Mamoru, 4,705,346, Cl. 350-96.140.
Mizutani, Morikazu; Onoda, Shigeyoshi; and Kanemitsu, Shinji, 4,705,384, Cl. 355-3.00R.
Nobuta, Hiroshi, 4,706,127, Cl. 358-280.000.
Nojiri, Hidetoshi; Miyazawa, Seiichi; Hakamada, Isao; and Hajimoto, Yoshioki, 4,706,254, Cl. 372-46.000.
Ohmori, Kouichi, 4,705,373, Cl. 354-127.110.
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,705,730, Cl. 430-57.000.
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,705,731, Cl. 430-57.000.
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Sugita, Yasutoshi, 4,705,958, Cl. 250-578.000.
Takayama, Makoto; and Sakurada, Nobuaki, 4,706,132, Cl. 358-336.000.
Tanioka, Hiroshi; Ogino, Yoshitaka; Inoue, Yutaka; Naito, Masataka; and Hayakawa, Kimiaki, 4,706,128, Cl. 358-286.000.
Yamakawa, Tadashi, 4,706,130, Cl. 358-296.000.
Yamamoto, Hiroshi; and Akashi, Akira, 4,705,380, Cl. 354-402.000.

Capobianco, Paul J.; Butwell, Kenneth F.; and Kossakowski, Edward J., to Union Carbide Corporation. Mixed solvent system for treating acidic gas. 4,705,673, Cl. 423-229.000.

Capsule Technology International, Ltd.: *See—*
Lukas, Stephen, 4,705,658, Cl. 264-25.000.

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Paul, Albert P.; and Card, Roger J., 4,705,570, Cl. 106-124.000.

Cargille, Donald R., to Hughes Aircraft Company. Infrared sensor comprising improved feedback limited amplifier and associated method for amplifying electronic signals. 4,705,946, Cl. 250-338.000.

Carle, Jean-Francois; and Phillippot, Patrick, to International Business Machines Corporation. Pulling processes and equipment for growing silicon crystals having high and controlled carbon content. 4,705,591, Cl. 156-617.0SP.

Carlson, Craig L.: *See—*
Orkin, Stanley S.; and Carlson, Craig L., 4,704,918, Cl. 74-579.00R.

Carlson, Richard A.: *See—*
Hennessy, James W.; Angel, Henry R.; and Carlson, Richard A., 4,706,207, Cl. 364-555.000.

Carnell, David: *See—*
Pole, Ernest G.; and Carnell, David, 4,705,816, Cl. 523-132.000.

Carrier Corporation: *See—*
Zogg, Robert A.; Robertson, Gerald F.; and Brown, Will C., 4,705,103, Cl. 165-110.000.

Carro-de-la-Fuente, Guillermo: *See—*
Canales-Santos, Enrique; Carro-de-la-Fuente, Guillermo; and Ruiz-Ontiveros, Saul R., 4,705,550, Cl. 65-32.000.

Carruthers, Alec R., to ALH Systems, Ltd. Mole with rotary vibrator. 4,705,116, Cl. 175-19.000.

Carse, Gregg D., to Pacific Bell. Low speed gate circuit. 4,706,241, Cl. 370-60.000.

Carter, Guy T.; Greenstein, Michael; Goodman, Joseph J.; Borders, Donald B.; Maiese, William M.; and Testa, Raymond T., to American Cyanamid Company. Antibiotic LL-E19020 α and β. 4,705,688, Cl. 424-122.000.

Carter, Robert J.; and Pecis, John G., to Folger Adam Company. Security door hinge system with locking elements. 4,704,767, Cl. 16-388.000.

Carter, William S., to Xilinx, Inc. Configurable logic element. 4,706,216, Cl. 365-94.000.

CasChem, Inc.: *See—*
Brauer, Melvin; Downey, William J.; and Naughton, Frank C., 4,705,723, Cl. 428-375.000.

Downey, William J.; Brauer, Melvin; and Chao, Jerry Chien-I, 4,705,724, Cl. 428-375.000.
Casey, Donald J.: *See*—
Wang, David W.; Casey, Donald J.; and Lehmann, Leonard T., 4,705,820, Cl. 524-381.000.
Cashaw, Alan G.; Cole, Robert; Holmes, Rory; Whitaker, Herbert L., Jr.; and Jackson, Lauren, to Chicopee Corporation. Operating room gown and drape fabric with improved repellent properties. 4,705,712, Cl. 428-152.000.
Catalytica Associates: *See*—
Grate, John H.; Hamm, David R.; and Valentine, Donald H., 4,705,883, Cl. 560-25.000.
Caunce, Benjamin R. J., to General Electric Company, p.l.c., The. Protection apparatus. 4,706,156, Cl. 361-80.000.
CBC Industries, Inc.: *See*—
Tsui, Gary; and Heimbigner, Thomas, 4,705,422, Cl. 403-60.000.
CBI Industries, Inc.: *See*—
Selcukoglu, Yuksel A., 4,704,877, Cl. 62-532.000.
CCA, Inc.: *See*—
Williams, Leslie P., 4,705,405, Cl. 366-160.000.
Cech, Jay: *See*—
Young, Peter L.; Cech, Jay; and Li, Kin, 4,705,606, Cl. 204-15.000.
Celamerck GmbH & Co. KG: *See*—
Itzel, Hanshelmut; and Barth, Volker, 4,705,191, Cl. 222-80.000.
Central Glass Company, Limited: *See*—
Matsumoto, Masakatsu; and Nishimura, Yasunobu, 4,705,884, Cl. 560-109.000.
Centre de Recherches en Physique des Plasma (CRPP): *See*—
Tran, Minh Q.; and Bondeson, Anders, 4,705,988, Cl. 315-4.000.
Centre National d'Etudes Spatiales (C.N.E.S.): *See*—
Regipa, Robert, 4,705,235, Cl. 244-31.000.
Centre Technique des Industries Mecaniques: *See*—
Lecerf, Jean-Pierre; Favey, Charles; and Meurice, Pierre, 4,705,059, Cl. 137-82.000.
Cerami, Anthony; Pongor, Sandor; and Brownlee, Michael, to Rockefeller University. Process for sulphation and phosphorylation of proteins and peptides. 4,705,845, Cl. 530-305.000.
Cesa, Mark C.; Rinz, James E.; and Kopp, Teodora T., to Standard Oil Company, The. Aryl oxime derivatives of hydantoins. 4,705,864, Cl. 548-309.000.
Cetus Corporation: *See*—
Levenson, Corey H.; and Mullis, Kary B., 4,705,886, Cl. 560-159.000.
Chaki, Kiyoshi: *See*—
Suga, Shigeru; Chaki, Kiyoshi; Natori, Etsuji; Suga, Shigeo; and Mitamura, Katsuaki, 4,704,903, Cl. 73-159.000.
Champion Spark Plug Europe S.A.: *See*—
Beneteau, Christian; and Guerard, Norbert, 4,704,762, Cl. 15-250.420.
South, Alan; and Kenney, Alan, 4,704,761, Cl. 15-250.190.
Chamuel, Jacques R., to Charles Stark Draper Laboratory, Inc., The. Crossed wire defect detector employing eddy currents. 4,706,021, Cl. 324-242.000.
Chanley, Charles S.: *See*—
Bernstein, Jonathan J.; Koger, T. Bruce; and Chanley, Charles S., 4,705,659, Cl. 264-29.600.
Channelwood Preservations Ltd.: *See*—
Robertson, Ian M., 4,705,436, Cl. 408-72.00R.
Chao, Jerry Chien-I: *See*—
Downey, William J.; Brauer, Melvin; and Chao, Jerry Chien-I, 4,705,724, Cl. 428-375.000.
Chapman, Robert M.: *See*—
Menchetti, Robert J.; and Chapman, Robert M., 4,704,837, Cl. 52-631.000.
Charles, Kirk W.: *See*—
Palm, Charles S.; Slayton, Danny L.; Lak, Khosrow; Sampson, Peter F.; Davis, David R.; Wheatley, Maurice S., Jr.; Chatham, Gregory A.; Jones, Wayne C.; Charles, Kirk W.; and Ireland, Anthony J., 4,705,385, Cl. 355-4.000.
Charles Stark Draper Laboratory, Inc., The: *See*—
Chamuel, Jacques R., 4,706,021, Cl. 324-242.000.
Charlton, Trevor G., to Spectrol Reliance Limited. Rotational optical encoder having binary output. 4,705,943, Cl. 250-231.0SE.
Chase Instruments Corporation: *See*—
Robinson, E. Howell, Jr., 4,705,551, Cl. 65-60.100.
Chase, Lee M.; and Sudikoff, David, to Measurex Corporation. Defect detector for cord reinforced tire fabric. 4,706,267, Cl. 378-61.000.
Chatham, Gregory A.: *See*—
Palm, Charles S.; Slayton, Danny L.; Lak, Khosrow; Sampson, Peter F.; Davis, David R.; Wheatley, Maurice S., Jr.; Chatham, Gregory A.; Jones, Wayne C.; Charles, Kirk W.; and Ireland, Anthony J., 4,705,385, Cl. 355-4.000.
Chaussy, Christian; Hepp, Wolfgang; van Rijn, Dick; and Forssmann, Bernd, to Dornier System GmbH. Coaxial location for contact free comminution of concrements. 4,705,026, Cl. 128-24.00A.
Chautemps, Jacques, to Thomson CSF. Photosensitive device with locally adjustable exposure time. 4,706,123, Cl. 358-213.190.
Chelette, K. Darrel, to Morris, James B. N. Tubular goods joint. 4,705,307, Cl. 285-332.300.
Chellis, LeRoy N.; and Ellis, Theron L., to International Business Machines Corporation. Process for providing a landless through-hole connection. 4,704,791, Cl. 29-852.000.
Chen, Chia H.: *See*—
Recktenwald, Diether J.; Kerndt, Rickie S.; Loken, Michael R.; and Chen, Chia H., 4,704,891, Cl. 73-1.00R.
Chen, James T. C. Method and circuit for reducing contact resistance of the potential probes of a four-point-probe in contact with a III-V compound semiconductor wafer. 4,706,015, Cl. 324-64.000.
Cheng, Steven S., to Bell Communications Research, Inc. Optical transmission network. 4,705,350, Cl. 350-96.160.
Cheng, Wu-Cheng; and Donnelly, Richard G., to W. R. Grace & Co. Sulfactants in acid-peptized catalyst compositions. 4,705,767, Cl. 502-167.000.
Cherian, Gabe: *See*—
Allen, Leslie J.; Cherian, Gabe; and Diaz, Stephen H., 4,705,205, Cl. 228-180.200.
Cherry, Kim N. Slidable storage container. 4,705,315, Cl. 296-37.100.
Cheruvu, Subrahmanyam, to Mobil Oil Corporation. Hydrosizing method and apparatus. 4,705,623, Cl. 209-161.000.
Chia, E. Henry, to Southwire Company. Exfoliation of surface oxide from continuously cast copper bar in conjunction with inline hot rolling. 4,705,096, Cl. 164-476.000.
Chicoine, Kellen J.: *See*—
Christianson, Leslie L.; Alcock, Ralph; Froehlich, Donell P.; and Chicoine, Kellen J., 4,705,449, Cl. 414-68.500.
Chicopee Corporation: *See*—
Cashaw, Alan G.; Cole, Robert; Holmes, Rory; Whitaker, Herbert L., Jr.; and Jackson, Lauren, 4,705,712, Cl. 428-152.000.
Chien, Du-Shieng: *See*—
Schoenwald, Ronald D.; and Chien, Du-Shieng, 4,705,798, Cl. 514-374.000.
Chiu, Kai F., to B.I. Industries, Inc. Multi-ply paper forming fabric with ovate warp yarns in lowermost ply. 4,705,601, Cl. 162-348.000.
Choi, Jae H.; Kanotz, William M.; and Vesperman, William C., to AT&T Technologies; and AT&T Bell Laboratories. Extrudable blend. 4,705,823, Cl. 524-474.000.
Choquelle, Jean: *See*—
Lauzier, Rene; Rollin, Jean; Choquelle, Jean; Dumas, Gerard; Breat, Francois; Rousson, Maurice; and Defour, Paule, 4,705,286, Cl. 280-281.00R.
Christ, Alfred; Lehmann, Helmuth; and Spiewok, Leonhard, to Sulzer-Escher Wyss Ltd. Treatment machine with rotatable treatment drum. 4,704,879, Cl. 68-140.000.
Christenson, Ronald E.; and McNeilus, Garwin B., to McNeilus Truck and Manufacturing, Inc. Tag axle assembly for work vehicle. 4,705,133, Cl. 180-209.000.
Christianson, Leslie L.; Alcock, Ralph; Froehlich, Donell P.; and Chicoine, Kellen J. Skid-steer vehicle. 4,705,449, Cl. 414-68.500.
Christoffel, Johannes, to Dihart AG. Reamer. 4,705,435, Cl. 408-59.000.
Chronar Corporation: *See*—
Akhtar, Masud, 4,705,701, Cl. 427-110.000.
Van Dine, John, 4,705,698, Cl. 427-53.100.
Chrysler Motors Corporation: *See*—
Goulart, Joseph F., 4,705,145, Cl. 188-18.00A.
Miesterfeld, Frederick O. R.; Fassnacht, Ronald E.; and McCambridge, John M., 4,706,082, Cl. 340-825.500.
Chu, Daniel Y. M., to Bio-Rad Laboratories, Inc. Destaining apparatus for electrophoresis gels. 4,705,056, Cl. 134-111.000.
Chung Telecommunications: *See*—
Cung, David, 4,706,264, Cl. 375-122.000.
Churchill, Thomas L.; and Ross, James M., to Electric Power Research Institute. Dynamic air gap measuring device for use with rotating electrical machinery. 4,704,906, Cl. 73-660.000.
CIBA-GEIGY Corporation: *See*—
Abel, Heinz; Schafer, Paul; and Berendt, Hans-Ulrich, 4,705,525, Cl. 8-555.000.
Abel, Heinz; Schafer, Paul; and Berendt, Hans-Ulrich, 4,705,526, Cl. 8-555.000.
Bedekovic, Davor; and Fletcher, Ian J., 4,705,776, Cl. 503-220.000.
Hubele, Adolf; and Eckhardt, Wolfgang, 4,705,790, Cl. 514-269.000.
Martin, Pierre; and Lang, Robert W., 4,705,801, Cl. 514-423.000.
Nyfeler, Robert; and Ehrenfreund, Josef, 4,705,800, Cl. 514-422.000.
Topfl, Rosemarie, 4,705,865, Cl. 548-341.000.
Zink, Rudolf; and Fletcher, Ian J., 4,705,775, Cl. 503-218.000.
Ciccarone, Angelo, to Alfa Romeo Auto S.p.A. Device for correcting functional, quantities in an internal combustion engine. 4,706,197, Cl. 364-431.080.
Ciocan, Dan N., to Conrac Corporation. System for stabilizing cathode emissions with an in-line gun cathode ray tube. 4,705,992, Cl. 315-383.000.
Citizen Watch Co., Ltd.: *See*—
Iwako, Akinobu, 4,706,005, Cl. 318-603.000.
Matsumoto, Hisayoshi, 4,705,412, Cl. 400-54.000.
Citta, Richard W.; Mutzabaugh, Dennis M.; and Sgrignoli, Gary J., to Zenith Electronics Corporation. Television signal scrambling system. 4,706,283, Cl. 380-12.000.
Citta, Richard W.; Mutzabaugh, Dennis M.; and Sgrignoli, Gary J., to Zenith Electronics Corporation. Television signal data transmission system. 4,706,284, Cl. 380-12.000.
Clairmont Camera, Inc.: *See*—
Robings, Kenneth W., 4,705,374, Cl. 354-225.000.
Clancey, Stephen M., to Eaton Corporation. Fluid coupling device having increased torque-transmitting capability. 4,705,149, Cl. 192-58.00B.
Clements, George W., to Seeger Corporation. Two-component metering pump. 4,705,461, Cl. 417-387.000.
Co, Ramon S.: *See*—
Watson, George A.; Co, Ramon S.; Fuhrman, James L.; and Avella, Frank, 4,706,244, Cl. 370-69.100.

Coad, George L.: *See*—
Layman, Frederick P.; Huntley, David A.; Dick, Paul H.; Coad, George L.; Kuhlman, Michael J.; Vecta, Roger M.; and Hobson, Phillip M., 4,705,951, Cl. 250-442.100.
Coal Industry (Patents) Limited: *See*—
Lockey, Joseph, 4,704,793, Cl. 30-187.000.
Coates, Stephen J., to Merkle Engineers, Inc. Insulated refractory shield. 4,705,475, Cl. 432-238.000.
Coca-Cola Company, The: *See*—
Aschberger, Matthias; Farber, Karlheinz; and Deininger, Anton, 4,705,193, Cl. 222-146.600.
Barrash, Marshall J., 4,705,186, Cl. 220-269.000.
Codd, Edwin T., to Tulserate Limited. Space frames. 4,704,836, Cl. 52-650.000.
Coffee, Curtis L. Electric-to-pressure transducer. 4,705,067, Cl. 137-487.500.
Coffman, Keith E.: *See*—
Ramsdale, Kurt A.; and Coffman, Keith E., 4,706,203, Cl. 364-509.000.
Cogema, Compagnie Generale des Matieres Nucleaires: *See*—
Pruchon, Philippe, 4,704,951, Cl. 98-1.500.
Cohn, Brian D.: *See*—
Ellerbroek, Brent L.; and Cohn, Brian D., 4,705,400, Cl. 356-353.000.
Colan, Mark E.: *See*—
Kinoshita, Roy Y.; McCollum, Patrick E.; and Colan, Mark E., 4,705,962, Cl. 307-247.100.
Cole, Robert: *See*—
Cashaw, Alan G.; Cole, Robert; Holmes, Rory; Whitaker, Herbert L., Jr.; and Jackson, Lauren, 4,705,712, Cl. 428-152.000.
Colgate Palmolive Company: *See*—
Barone, Patrizia; and Ramachandran, Pallassana N., 4,705,644, Cl. 252-135.000.
Vellekoop, Linda J., 4,705,680, Cl. 424-55.000.
Colineau, Joseph; and Ahmari, Hossein, to Societe Electronique de la Region Pays de Loire. Geometry adjustment circuit for a color video projector producing vertical amplitude, vertical linearity and horizontal trapezoid correction signals from a single user-controlled signal. 4,706,115, Cl. 358-60.000.
Collier, David W., to Eclipse, Inc. Recuperative radiant tube heating system. 4,705,022, Cl. 126-91.00A.
Colorocs Corporation: *See*—
Palm, Charles S.; Slayton, Danny L.; Lak, Khosrow; Sampson, Peter F.; Davis, David R.; Wheatley, Maurice S., Jr.; Chatham, Gregory A.; Jones, Wayne C.; Charles, Kirk W.; and Ireland, Anthony J., 4,705,385, Cl. 355-4.000.
Combustion Engineering, Inc.: *See*—
Waryasz, Richard E., 4,704,992, Cl. 122-4.00D.
Commissariat a l'Energie Atomique: *See*—
Tilliette, Zephyr, 4,705,662, Cl. 376-405.000.
Communications Technology Corporation: *See*—
Hilligoss, Lawrence O.; and Hilligoss, William R., 4,706,271, Cl. 379-49.000.
Compagnie Francaise des Petroles: *See*—
Raoult, Jean-Jacques, 4,706,225, Cl. 367-57.000.
Compagnie Generale d'Electricite: *See*—
Brunet, Henri; Mabru, Michel; and Gastaud, Michel, 4,706,257, Cl. 372-88.000.
Congdon, John C., to Magnavox Government and Industrial Electronics Company. Electroacoustic transducer. 4,706,229, Cl. 367-159.000.
Connors, Herman J., Jr.; and Kramer, Francis A., to Westinghouse Electric Corp. Steam control valve with improved muffler portion. 4,705,071, Cl. 137-625.300.
Conoco Inc.: *See*—
Fair, Delbert W., 4,705,137, Cl. 181-120.000.
Conrac Corporation: *See*—
Ciocan, Dan N., 4,705,992, Cl. 315-383.000.
Conrad, Rodney W., to Romed Corporation. Method and apparatus for automatic sampling of gases. 4,704,910, Cl. 73-863.210.
Consolidated Electric Co.: *See*—
Gardeen, John A., 4,705,456, Cl. 417-7.000.
Constant, Georges, deceased: *See*—
Buttazzoni, Bernard; Leseur, Philippe; Thebault, Jacques; and Constant, Georges, deceased, 4,705,694, Cl. 427-2.000.
Constant, Marie-Josette, Francoise Constant, Philippe Constant, executors: *See*—
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Continental White Cap, Inc.: *See*—
Moloney, John J., 4,705,183, Cl. 215-276.000.
Control Devices, Incorporated: *See*—
Krechel, Joseph L.; Purvis, Michael J.; and Ross, Paul F., II, 4,705,076, Cl. 137-883.000.
Conway, John K.: *See*—
Fanshawe, Hew D.; and Conway, John K., 4,705,082, Cl. 141-4.000.
Cook, Ronald L. Method for deriving phenyl isocyanate from benzene and potassium isocyanate. 4,705,609, Cl. 204-59.00R.
Coombs, Daniel M.; Cymbaluk, Ted H.; Bertus, Brent J.; and Kukes, Simon G., to Phillips Petroleum Company. Coprecipitate of metal phosphates. 4,705,768, Cl. 502-213.000.
Coope, Daniel F., to NL Industries, Inc. Formation density logging while drilling. 4,705,944, Cl. 250-254.000.
Cooper, Ralph M.: *See*—
Hayes, Earl J.; and Cooper, Ralph M., 4,705,339, Cl. 439-277.000.
Cordis Corporation: *See*—
Giurtino, Joel F., 4,705,042, Cl. 128-419.0PT.
Hooven, Michael D., 4,705,499, Cl. 604-9.000.
Corob S.R.L. Automatic Machinery Project: *See*—
Rossetti, Edoardo, 4,705,083, Cl. 141-104.000.
Costello, Thomas J.: *See*—
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,704,976, Cl. 112-262.200.
Cotter, Robert J.: *See*—
Kawakami, James H.; Harris, James E.; Maresca, Louis M.; Robeson, Lloyd M.; and Cotter, Robert J., 4,705,822, Cl. 524-425.000.
Council, Malcolm N.; and Baker, Walter, to Otis Engineering Corporation. Apparatus and methods for cleaning a well. 4,705,107, Cl. 166-170.000.
Craig, Clark E., to Valhi, Inc. Locking system. 4,705,326, Cl. 312-221.000.
Cransac, Jean-Pierre; Jogand, Patrick; and Sauvage, Michel, to Electricite de France Service National. Fast neutron nuclear reactor equipped with a central handling cell and a boxed slab. 4,705,661, Cl. 376-206.000.
Crawford, Frank B.: *See*—
Mueller, Peter R.; Brown, Alan S.; Tolkoff, Marc J.; and Crawford, Frank B., 4,705,040, Cl. 128-334.00R.
Creaden, David E., to Lawrence Paper Company. Fluorescent tube dunnage. 4,705,170, Cl. 206-419.000.
Creative Talent, Inc.: *See*—
Espo, Andrew M., 4,705,355, Cl. 350-117.000.
Criton Technologies: *See*—
Sadigh-Behzadi, Amir-Akbar, 4,705,332, Cl. 439-69.000.
Crivello, James V., to General Electric Company. Aromatic polyvinyl ethers and heat curable molding compositions obtained therefrom. 4,705,887, Cl. 560-190.000.
Cronch, Darell D.; Fisher, Richard T.; Graham, Patricia A.; and Passafiume, John E., to International Business Machines Corporation. Self-adjusting homing for a stepping motor. 4,706,008, Cl. 318-696.000.
Crosby, Gaius P.: *See*—
Sanderson, Robert A.; and Crosby, Gaius P., 4,704,970, Cl. 109-73.000.
Cross, Dan A., to Boeing Company, The. Turn gate for use with a robotic wire harness assembly system. 4,704,775, Cl. 29-33.00M.
Cross, Neill C. Color processing system for television camera. 4,706,114, Cl. 358-50.000.
Crowe, David F.; Tanabe, Masato; and Peters, Richard, to SRI International. 9α, 11β-substituted and 11β-substituted estranes. 4,705,783, Cl. 514-180.000.
Crush, John F.: *See*—
Torre, Frank M.; Crush, John F.; and Masak, Raymond J., 4,706,261, Cl. 375-27.000.
CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Fabbri, Bruno, 4,706,014, Cl. 324-61.00P.
Cubbison, Richard J., Jr., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Dynamic impedance element for a battery feed circuit. 4,706,281, Cl. 379-322.000.
Cullo, Leonard A.; Nagle, Elliott V., Jr.; Restelli, Edward F., Jr.; and Yogan, Thomas J., to Aristech Chemical Corporation. Method of making anatase-titania attrition-resistant catalyst composition. 4,705,770, Cl. 502-242.000.
Culpepper, Will L.: *See*—
Feliks, James J.; Culpepper, Will L.; and Scott, Dale K., 4,705,159, Cl. 198-468.800.
Cumbie, Carlyen F. Tray support for wheelchair. 4,705,287, Cl. 280-289.0WC.
Cumming, Norman S.: *See*—
Remp, Stephen E.; Ewen, Rodger M. H.; and Cumming, Norman S., 4,704,986, Cl. 118-318.000.
Cummings, Darold B. Computer keyboard adaptor. 4,704,940, Cl. 84-425.000.
Cung, David, to Chung Telecommunications. Digital data compression method and means. 4,706,264, Cl. 375-122.000.
Cunningham, S. Michael: *See*—
Prouty, Robert E.; and Cunningham, S. Michael, 4,706,037, Cl. 335-248.000.
Cunningham, Sinclair: *See*—
Wusthof, Peter; and Cunningham, Sinclair, 4,704,948, Cl. 92-58.000.
Cur, Omer N., to Whirlpool Corporation. Locally inverted fin for an air conditioner. 4,705,105, Cl. 165-151.000.
Curran, Patrick A., to Texas Instruments Incorporated. Process for making a buried conductor by fusing two wafers. 4,704,785, Cl. 437-110.000.
Curtze, Edward W., to Libbey-Owens-Ford Co. Painting mask and fixture. 4,704,987, Cl. 118-500.000.
Cyberware Laboratory Inc.: *See*—
Addleman, David A.; and Addleman, Lloyd A., 4,705,401, Cl. 356-376.000.
Cymbaluk, Ted H.: *See*—
Coombs, Daniel M.; Cymbaluk, Ted H.; Bertus, Brent J.; and Kukes, Simon G., 4,705,768, Cl. 502-213.000.
D. Drukker & Z.N. N.V.: *See*—
van Bennekom, Peter K.; and Seal, Michael, 4,705,935, Cl. 219-121.0LC.
D-Tec, Inc.: *See*—
Parsons, Norman H., 4,704,896, Cl. 73-37.900.
Dahl, Hans K., to Sulzer-Escher Wyss GmbH. Hydraulic pressing shoe with an adjustable circumferential press zone. 4,705,602, Cl. 162-358.000.

Daido Tokushuko Kabushiki Kaisha: *See*—
Sugiura, Saburo; Kanada, Kenji; Demukai, Noboru; and Okamoto, Tetsuo, 4,706,258, Cl. 373-2.000.
Daimler-Benz Aktiengesellschaft: *See*—
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Dumoulin, Charles L., to General Electric Company. Suppression of non-coupled spins in NMR imaging and spectroscopy. 4,706,024, Cl. 324-309.000.
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Durham, Roger O. Two-piece crankshaft for bicycles. 4,704,919, Cl. 74-594.100.

Durivage, Leon W.; and Farrington, Ronald L., to Square D Company. Restraint signal interface circuit. 4,706,155, Cl. 361-64.000.

DuVall, Dale R.; Bateson, John E.; Hewitt, Lew V.; and Hewitt, David P., to Overhead Door Corporation of Texas. Acoustic obstruction detector and method. 4,706,227, Cl. 367-96.000.

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Dykes, James R. King pin lock. 4,704,883, Cl. 70-232.000.

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Buschmann, Ernst; Himmele, Walter; Eckhardt, Heinz; Ernst, Hansgeorg; Rademacher, Wilhelm; and Jung, Johann, 4,705,553, Cl. 71-76.000.

Eckhardt, Wolfgang: *See*—
Hubele, Adolf; and Eckhardt, Wolfgang, 4,705,790, Cl. 514-269.000.

Eckstein, Karlheinz, to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig Helland, Stiftung & Co. KG. Method for making magnetic heads. 4,704,788, Cl. 29-603.000.

Eclipse, Inc.: *See*—
Collier, David W., 4,705,022, Cl. 126-91.00A.

Eclipse Technologies: *See*—
Forti, Steven A.; and McNulty, Robert F., Jr., 4,706,070, Cl. 340-508.000.

Ecole Nationale Superieure de Mecanique et des Microtechniques: *See*—
Besson, Raymond; Delaite, Richard; Genestier, Gerard; Maitre, Pierre; Renard, Georges; Thiebaud, Daniel; and Valentin, Jean-Pascal, 4,705,982, Cl. 310-356.000.

Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., to National Research Development Corporation. Methods of producing image formation from objects. 4,706,025, Cl. 324-309.000.

Edson, Sydney: *See*—
Howard, Fred; and Edson, Sydney, 4,705,175, Cl. 211-59.200.

Edwards, A. Russell: *See*—
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,704,976, Cl. 112-262.200.

Edwards, Preston. Trash bag holding device. 4,705,249, Cl. 248-101.000.

Efird, Lee A.: *See*—
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,704,976, Cl. 112-262.200.

Egawa, Akira; and Noudomi, Ryoichi, to Kabushiki Kaisha Komatsu Seisakusho. Laser device of AC discharge excitation type. 4,706,252, Cl. 372-38.000.

Eger, Georg: *See*—
Srock, Rainer; and Eger, Georg, 4,704,822, Cl. 49-502.000.

Egli, Werner, to Armaturenfabrik Wallisellen AG. Single-lever mixing fixture. 4,705,072, Cl. 137-625.170.

EgoKiefer AG: *See*—
Liebl, Rudolf; and Bosshard, Ernst, 4,705,469, Cl. 425-117.000.

Eguchi, Ken; Nishimura, Yukuo; Haruta, Masahiro; Matsuda, Hiroshi; Hirai, Yutaka; and Nakagiri, Takashi, to Canon Kabushiki Kaisha. Apparatus and method for measuring a photometric characteristic of a sample portion. 4,705,403, Cl. 356-319.000.

Ehrenfreund, Josef: *See*—
Nyfeler, Robert; and Ehrenfreund, Josef, 4,705,800, Cl. 514-422.000.

Ehrfeld, Wolfgang: *See*—
Becker, Erwin; Ehrfeld, Wolfgang; and Hagmann, Peter, 4,705,605, Cl. 204-11.000.

Eidsmore, Paul G. Isolation on/off valve. 4,705,070, Cl. 137-614.210.

Eisenberg, Helmut; von Heimburg, Henning; Weber, Friedhelm; Beste, Achim; and Vorderbruck, Dirk, to Vossloh-Werke GmbH. Arrangement for securing railway rails onto sleepers. 4,705,215, Cl. 238-349.000.

Eldridge, Charles J., to Temple University-of the Commonwealth System of Higher Education. Wrapper for delivering sterile disposables. 4,705,171, Cl. 206-438.000.

Electric Power Research Institute: *See*—
Churchill, Thomas L.; and Ross, James M., 4,704,906, Cl. 73-660.000.

Electric Power Research Institute, Inc.: *See*—
Wood, Christopher J.; Bradbury, David; Swan, Timothy; Segal, Michael G.; and Sellers, Robin M., 4,705,573, Cl. 134-3.000.

Electricite de France: *See*—
Barbillat, Claude, 4,705,185, Cl. 220-222.000.

Electricite de France Service National: *See*—
Cransac, Jean-Pierre; Jogand, Patrick; and Sauvage, Michel, 4,705,661, Cl. 376-206.000.
Dolhen, Gerard; Oberlin, Claude; Lemarquis, Jean-Claude; and Bandura, Daniel, 4,705,259, Cl. 251-61.100.

Electrotel, Inc.: *See*—
Barbare, Walter L.; Willey, Harley M.; and Higgins, Ronald D., 4,706,280, Cl. 379-284.000.

Elektro-Brite GmbH: *See*—
Klos, Klaus-Peter; Lindemann, Karl-Heinz; and Birnstiel, Willi, 4,705,576, Cl. 148-6.200.

Ellerbroek, Brent L.; and Cohn, Brian D., to Hughes Aircraft Company. Shearing phase difference sensor. 4,705,400, Cl. 356-353.000.

Ellis, Theron L.: *See*—
Chellis, LeRoy N.; and Ellis, Theron L., 4,704,791, Cl. 29-852.000.

Else, Mark: *See*—
Komorowski, Robert B.; and Else, Mark, 4,705,477, Cl. 434-24.000.

Eltreva AG: *See*—
Emmer, Hans, 4,704,831, Cl. 52-235.000.

Embury, Janon F., Jr.: *See*—
Sellman, Leonard R.; Embury, Janon F., Jr.; and Beyth, Werner W., 4,704,966, Cl. 102-334.000.

Emerson Electric Co.: *See*—
Reed, Gueary T., Jr., 4,705,255, Cl. 248-317.000.

Emhart Industries, Inc.: *See*—
Liska, Timothy J.; and Scott, Paul F., 4,705,552, Cl. 65-158.000.

Emmer, Hans, to Eltreva AG. Facade wall. 4,704,831, Cl. 52-235.000.

Emura, Katsumi: *See*—
Minemura, Kouichi; Shikada, Minoru; and Emura, Katsumi, 4,706,300, Cl. 455-619.000.

Enders, George E., to NRM Corporation. Tire building machine. 4,705,589, Cl. 156-401.000.

Endo, Seiji; and Kikuchi, Eiji, to Sumitomo Electric Industries, Ltd. Terminal connector assembly for multiconductor cable. 4,705,482, Cl. 439-460.000.

Endo, Yasuhisa; Mizuhara, Shuhei; Murakami, Satoshi; Beppu, Osamu; and Toshioka, Saiji, to Mitsui Engineering and Shipbuilding Co. Ltd. Device for preventing abnormal flow of gas fuel from gas fuel injector of diesel engine. 4,704,997, Cl. 123-198.0DB.

Engineering Measurements Co.: *See*—
Miller, Charles E.; Poland, Robert L.; and Yoshida, Louis T., 4,705,212, Cl. 236-54.000.

English Clays Lovering Pochin & Company, Limited: *See*—
Burr, Kenneth J.; Smith, Laurence S.; and Hazelden, David, 4,704,899, Cl. 73-61.00R.

Ennis, Melvyn S. J. Hammer for use in a bore hole and apparatus for use therewith. 4,705,118, Cl. 175-65.000.

Enstrom, Ronald E.: *See*—
Kaganowicz, Grzegorz; Enstrom, Ronald E.; and Robinson, John W., 4,705,760, Cl. 437-234.000.

Epsco, Inc.: *See*—
Bear, Richard W., 4,704,833, Cl. 52-309.200.

Erf, Robert K.: *See*—
Puffer, Leroy G.; and Erf, Robert K., 4,705,957, Cl. 250-56.00B.

Erickson, Merlin L.: *See*—
Milstead, Leon R.; Lowe, Laban R.; Schnepfe, Robert W., Jr.; and Erickson, Merlin L., 4,704,967, Cl. 102-334.000.

Erno Raumfahrttechnik GmbH: *See—*
Bruns, Helmut; Freiheit, Artur; and Kolley, Arnold, 4,705,546, Cl. 55-182.000.

Ernst, Hansgeorg: *See—*
Buschmann, Ernst; Himmele, Walter; Eckhardt, Heinz; Ernst, Hansgeorg; Rademacher, Wilhelm; and Jung, Johann, 4,705,553, Cl. 71-76.000.

Ernst Leitz Wetzlar GmbH: *See—*
Atalar, Abdullah, 4,706,048, Cl. 333-32.000.

Ero-Con, Inc.: *See—*
Atkins, David A.; and Atkins, Donald F., 4,705,427, Cl. 405-36.000.

Espenschied, Bernd; and Klein, Peter, to Hoechst Aktiengesellschaft. Rapidly crystallizing polyester materials and a process for their preparation. 4,705,844, Cl. 528-275.000.

Espo, Andrew M., to Creative Talent, Inc. Motion picture screen assembly. 4,705,355, Cl. 350-117.000.

Essef Corporation: *See—*
LeBreton, Edward T., 4,705,468, Cl. 425-116.000.

Essex Group, Inc.: *See—*
Poulin, Benoît L., 4,705,657, Cl. 264-22.000.

Esswein, S.A.: *See—*
Vrignaud, Dorice, 4,704,890, Cl. 72-428.000.

Estrin, Jorge A.: *See—*
Karnavas, Alexander G.; and Estrin, Jorge A., 4,705,508, Cl. 604-113.000.

Etablissements Lauzier: *See—*
Lauzier, Rene; Rollin, Jean; Choquelle, Jean; Dumas, Gerard; Breat, Francois; Rousson, Maurice; and Defour, Paule, 4,705,286, Cl. 280-281.00R.

Etat Francais: *See—*
Marcon, Joel M.; Durant, Jacques A.; and Simon, Georges H., 4,704,945, Cl. 89-185.000.

Etat Francais as represented by the Deleque General pour l'Armement: *See—*
Dieulesaint, Eugene J.; and Royer, Daniel R., 4,706,046, Cl. 331-155.000.

Evans, Robert: *See—*
Gordon, Alan J.; Billington, Donald G.; Evans, Robert; and Bowman, David J., 4,705,630, Cl. 210-361.000.

Evert, Robert P.; and Miller, James A., to Aluminum Company of America. Stretch-forming process. 4,704,886, Cl. 72-57.000.

Ewangelidis, Stawros: *See—*
Reichert, Karl-Heinz; Schoeppel, Wolfgang; Ewangelidis, Stawros; Bednarz, Jurgen; and Leute, Ulrich, 4,705,648, Cl. 252-512.000.

Ewen, Rodger M. H.: *See—*
Remp, Stephen E.; Ewen, Rodger M. H.; and Cumming, Norman S., 4,704,986, Cl. 118-318.000.

Ewing, Douglas E.: *See—*
Hendry, Lawrence B.; Diamond, Ana H.; Diamond, Bruce I.; and Ewing, Douglas E., 4,705,796, Cl. 514-328.000.

Exxon Production Research Company: *See—*
Zimmerman, Carol J., 4,706,223, Cl. 367-38.000.

Exxon Research and Engineering Company: *See—*
Goldblatt, Irwin L.; and Mendelson, Leah T., 4,705,641, Cl. 252-35.000.
McCandlish, Larry E.; and Ho, Teh C., 4,705,619, Cl. 208-112.000.
Siskin, Michael; Brons, Glen B.; and Green, Gary S., 4,705,622, Cl. 208-289.000.

F.R.P. Industires, Inc.: *See—*
Moore, James G., 4,704,991, Cl. 119-73.000.

Fabbri, Bruno, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Capacitive devices for measuring the diameter of a dielectric fiber. 4,706,014, Cl. 324-61.00P.

Fabbrica Italiana Magneti Marelli S.p.A.: *See—*
Izzi, Gilberto, 4,705,607, Cl. 204-15.000.

Fabricas Lucia, Antonio Betere, S.A.: *See—*
Guerra, Fernando G., 4,704,751, Cl. 5-236.00R.

Fair, Delbert W., to Conoco Inc. Marine shear wave vibrator. 4,705,137, Cl. 181-120.000.

Fairchild Camera and Instrument Corporation: *See—*
Richardson, Neil, 4,706,019, Cl. 324-158.00R.

Fanshawe, Hew D.; and Conway, John K. Method of and apparatus for filling a container with gas. 4,705,082, Cl. 141-4.000.

Fanuc Ltd.: *See—*
Aso, Toshiyuki; and Tshibashi, Tamotu, 4,705,932, Cl. 219-69.00V.
Fukuyama, Hiroomi, 4,706,002, Cl. 318-568.000.
Kiah, Hajimu; Seki, Masaki; Takegahara, Takashi; and Onishi, Yasushi, 4,706,201, Cl. 364-474.000.
Kishi, Hajimu; Sakakibara, Shinsuke; Ishikawa, Haruyuki; and Kanda, Yuuichi, 4,706,000, Cl. 318-568.000.
Kishi, Hajimu; Seki, Masaki; and Takegahara, Takashi, 4,706,200, Cl. 364-474.000.
Nakashima, Seiichiro; Toyoda, Kenichi; and Torii, Nobutoshi, 4,706,001, Cl. 318-568.000.
Nakashima, Seiichiro; Toyoda, Kenichi; and Sakakibara, Shinsuke, 4,706,003, Cl. 318-568.000.

Farber, Karlheinz: *See—*
Aschberger, Matthias; Farber, Karlheinz; and Deininger, Anton, 4,705,193, Cl. 222-146.600.

Farnworth, Brian: *See—*
Cain, J. Bradley; and Farnworth, Brian, 4,705,717, Cl. 428-252.000.

Faroudja Laboratories, Inc.: *See—*
Faroudja, Yves C.; and Campbell, Jack J., 4,706,112, Cl. 358-31.000.

Faroudja, Yves C.; and Campbell, Jack J., to Faroudja Laboratories, Inc. Cross color suppression for quadrature modulated color television. 4,706,112, Cl. 358-31.000.

Farrington, Ronald L.: *See—*
Durivage, Leon W.; and Farrington, Ronald L., 4,706,155, Cl. 361-64.000.

Fassbender, Rolf, to Zahnradfabrik Friedrichshafen, AG. Hydrostatic steering arrangement, especially for motor vehicles. 4,705,129, Cl. 180-132.000.

Fassnacht, Ronald E.: *See—*
Miesterfeld, Frederick O. R.; Fassnacht, Ronald E.; and McCambridge, John M., 4,706,082, Cl. 340-825.500.

Fast, Jacob. Multipurpose sign holder. 4,704,813, Cl. 40-11.00R.

Faucher, Paul W. Ostomy pouch cover. 4,705,512, Cl. 604-332.000.

Favey, Charles: *See—*
Lecerf, Jean-Pierre; Favey, Charles; and Meurice, Pierre, 4,705,059, Cl. 137-82.000.

Fedele, Nicola J.; and Acampora, Alfonse A., to RCA Corporation. DPCM system with rate-of-fill control of buffer occupancy. 4,706,260, Cl. 375-27.000.

Federal-Mogul Corporation: *See—*
Lewis, Roger L., 4,705,017, Cl. 125-15.000.

Fedotov, Vasilij: *See—*
Fleischer, Klaus; Gohler, Peter; Mangler, Rolf; Reuther, Christian; Schingnitz, Manfred; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir; Fedotov, Vasilij; and Rodionov, Boris, 4,704,971, Cl. 110-264.000.

Fel-Pro Incorporated: *See—*
Locacius, Robert F.; and Zelenka, Terence, 4,705,278, Cl. 277-235.00B.

Felasto Pur GmbH & Co. KG: *See—*
Oerding, Horst, 4,705,325, Cl. 305-35.00R.

Feld, Thomas A.: *See—*
Nunn, Adrian D.; Feld, Thomas A.; and Treher, Elizabeth N., 4,705,849, Cl. 534-14.000.

Feldman, Donald W.: *See—*
Ryan, Frederick M.; Gottlieb, Milton; and Feldman, Donald W., 4,705,362, Cl. 350-372.000.

Feliks, James J.; Culpepper, Will L.; and Scott, Dale K., to Mead Corporation, The. Conveying system for removing containers from a packaging machine. 4,705,159, Cl. 198-468.800.

Ferag AG: *See—*
Honegger, Werner, 4,705,227, Cl. 242-59.000.

Ferd Ruesch AG: *See—*
Keller, Heinz; Brocker, Heinz; and Lehner, Martin, 4,705,608, Cl. 204-28.000.

Ferrigno, Giancarlo: *See—*
Pedotti, Antonio; and Ferrigno, Giancarlo, 4,706,296, Cl. 382-42.000.

Ferro, Francesco: *See—*
Nerli, Giovanni; Grego, Francesco; Bottos, Roberto; and Ferro, Francesco, 4,704,859, Cl. 57-401.000.

Fertig, Gunter, to Mannesmann Rexroth GmbH. Directional control valve having a built-in flow control valve. 4,705,069, Cl. 137-596.000.

Fiat Auto S.p.A.: *See—*
Panizza, Ettore, 4,706,086, Cl. 340-902.000.

Fields, John T. Ultrasonic radiator cleaning system. 4,705,054, Cl. 134-57.00R.

Fieseler, Heinrich: *See—*
Theissen, Friedel; and Fieseler, Heinrich, 4,705,189, Cl. 220-465.000.

Fijnvandraat, Jacob G.: *See—*
Dohmen, Gerardus M.; Fijnvandraat, Jacob G.; and Sastra, Budiman, 4,706,146, Cl. 360-122.000.

Fikentscher, Rolf: *See—*
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,705,649, Cl. 260-402.000.

Finn, Peter J.: *See—*
Kitchin, Jonathan P.; Powers, Stephen R.; Penfound, Keith A.; Finn, Peter J.; and Fisher, Michael G., 4,705,745, Cl. 430-505.000.

Fisch, Richard S., to Minneaota Mining and Manufacturing Company. Graphic arts imaging constructions using vapor-deposited colorant and metalloid layers with overlying photosensitive resist layer. 4,705,739, Cl. 430-276.000.

Fischer & Porter Company: *See—*
Mannherz, Elmer D.; Schmoock, Roy F.; and Shauger, Herbert A., 4,704,907, Cl. 73-861.170.

Fisher Dynamics Corporation: *See—*
Bell, Robert L., 4,705,319, Cl. 297-362.000.

Fisher, Michael G.: *See—*
Kitchin, Jonathan P.; Powers, Stephen R.; Penfound, Keith A.; Finn, Peter J.; and Fisher, Michael G., 4,705,745, Cl. 430-505.000.

Fisher, Richard T.: *See—*
Cronch, Darell D.; Fisher, Richard T.; Graham, Patricia A.; and Passafiume, John E., 4,706,008, Cl. 318-696.000.

Fleischer, Klaus; Gohler, Peter; Mangler, Rolf; Reuther, Christian; Schingnitz, Manfred; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir; Fedotov, Vasilij; and Rodionov, Boris, to Brennstoffinstitut Freiberg. Pulverized-coal burner. 4,704,971, Cl. 110-264.000.

Fletcher, Ian J.: *See—*
Bedekovic, Davor; and Fletcher, Ian J., 4,705,776, Cl. 503-220.000.
Zink, Rudolf; and Fletcher, Ian J., 4,705,775, Cl. 503-218.000.

FloScan Instrument Company, Inc.: *See—*
Baatz, Wilfried; and Ahlquist, Norman C., 4,706,083, Cl. 340-825.060.

Flowtec AG: *See—*
Blatter, Max, 4,704,908, Cl. 73-861.170.
Flynn, Michael: *See—*
Tosh, Douglas; and Flynn, Michael, 4,705,841, Cl. 528-59.000.
Flynn, William C.: *See—*
Kopf, Rowland J., deceased; and Flynn, William C., 4,705,200, Cl. 227-9.000.
FMC Corporation: *See—*
Maravetz, Lester L., 4,705,557, Cl. 71-92.000.
Folger Adam Company: *See—*
Carter, Robert J.; and Pecis, John G., 4,704,767, Cl. 16-388.000.
Fomina, Vera V.: *See—*
Ivanov, Mikhail A.; Komkov, Jury A.; and Fomina, Vera V., 4,705,876, Cl. 556-149.000.
Fondazione Pro Juventute Don Carlo Gnocchi: *See—*
Pedotti, Antonio; and Ferrigno, Giancarlo, 4,706,296, Cl. 382-42.000.
Fong, Howard L.; Diaz, Zaida; and Blytas, George C., to Shell Oil Company. Recovery of sulfur from a solid sulfur-containing solution of a solubilized iron chelate. 4,705,676, Cl. 423-567.00A.
Fontannaz, Manuel. Device for fixing the wishbone boom to the mast of a sailboard. 4,704,980, Cl. 114-98.000.
Forbes, Hampton E., Jr., to Westvaco Corporation. Carryout tray with diverse apertures. 4,705,173, Cl. 206-563.000.
Ford Aerospace & Communications Corporation: *See—*
Avila, Louis J.; Merritt, John E.; and Hempling, Norman G., 4,706,047, Cl. 332-19.000.
Ford Motor Company: *See—*
Wilhelmy, Egon, 4,704,916, Cl. 74-475.000.
Forneris, Alexandre, to Hutchinson S.A. Wheel with locking sleeve. 4,705,089, Cl. 152-400.000.
Forssmann, Bernd: *See—*
Chaussy, Christian; Hepp, Wolfgang; van Rijn, Dick; and Forssmann, Bernd, 4,705,026, Cl. 128-24.00A.
Forti, Steven A.; and McNulty, Robert F., Jr., to Eclipse Technologies. Outboard motor alarm system. 4,706,070, Cl. 340-508.000.
Foss, George D.: *See—*
Burguette, Mario D.; and Foss, George D., 4,705,699, Cl. 427-54.100.
Foster, John D., to Ogg, Robert; and Mulholland, John H., part interest to each. Piston. 4,704,949, Cl. 92-160.000.
Foster, Rudolph. Writing shield. 4,704,742, Cl. 2-21.000.
Fought, Eric R.: *See—*
Andresen, Brian D.; and Fought, Eric R., 4,705,616, Cl. 204-299.00R.
Fought, Gerald E., to Gradall Company, The. Material handling vehicle stabilizer. 4,705,295, Cl. 280-754.000.
Fowler, James M., to Masco Corporation. Electronically controlled electric steam humidifier. 4,705,936, Cl. 219-295.000.
Framatome: *See—*
Frizot, Alain; Cadaureille, Gerard; Lalere, Jean C.; and Machuron, Jean-Yves, 4,704,801, Cl. 33-502.000.
Franco, Dario: *See—*
Astegiano, Luciano; Bertoglio, Ottavio; Bosco, Fulvio; de Bosio, Alfredo; Franco, Dario; Lampiano, Piero; Melle, Antonio; and Rosboch, Luciano, 4,706,270, Cl. 379-2.000.
Frank J. Zamboni & Co. Inc.: *See—*
Zamboni, Richard F., 4,705,320, Cl. 299-24.000.
Franklin, Paulie H. Stringed musical instrument. 4,704,935, Cl. 84-312.00P.
Frankstein, Brois: *See—*
Lev, Monick; and Frankstein, Brois, 4,704,846, Cl. 53-522.000.
Franz, Herbert; and Pfluger, Gerhard, to Robert Bosch GmbH. Easily serviceable alternator, particularly for vehicular use. 4,705,983, Cl. 310-68.00D.
Frase, Dietmar: *See—*
Boing, Rolf; Frase, Dietmar; and Noeske, Manfred, 4,704,895, Cl. 73-104.000.
Fraze, Ermal C.: *See—*
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Wynn, David K.; and Gregg, James R., 4,704,887, Cl. 72-347.000.
Frazier, Gary A.; Frensley, William R.; and Reed, Mark A., to Texas Instruments Incorporated. Spatial light modulator. 4,705,361, Cl. 350-355.000.
Frearson, William H., to Avdel Limited. Breakstem fastener installation tool. 4,704,888, Cl. 72-391.000.
Frederick, Stanley H.: *See—*
Weir, Donald H.; Frederick, Stanley H.; Hotaling, Robert A.; and Robol, Ronald B., 4,705,629, Cl. 210-340.000.
Freeman, Richard I.: *See—*
Su, Chin B.; Lanzisera, Vincent A.; and Freeman, Richard I., 4,706,253, Cl. 372-44.000.
Frei & Egger AG: *See—*
Frei, Peter, 4,705,258, Cl. 249-27.000.
Frei, Peter, to Frei & Egger AG. Sheathing for pouring a container fabricated from concrete. 4,705,258, Cl. 249-27.000.
Freiheit, Artur: *See—*
Bruns, Helmut; Freiheit, Artur; and Kolley, Arnold, 4,705,546, Cl. 55-182.000.
French, William W., to Eastman Kodak Company. Sputtering method of making thin film head having improved saturation magnetization. 4,705,613, Cl. 204-192.200.
Frensley, William R.: *See—*
Frazier, Gary A.; Frensley, William R.; and Reed, Mark A., 4,705,361, Cl. 350-355.000.
Fres-Co System USA, Inc.: *See—*
Goglio, Luigi, 4,705,174, Cl. 206-632.000.
Fried, Steven J. Rapid solution administration set with integral heat exchanger. 4,705,505, Cl. 604-80.000.
Friesen, Henry; and van Hooydonk, Antonius H. G., to Deere & Company. Valve control lockout. 4,704,915, Cl. 74-471.0XY.
Frisch, Kurt C.; Klempner, Daniel; Radisch, Helmer; and Holzer, Gerhard, to Saint-Gobain Vitrage. Polyurethane-based adhesive coating or film, and use of same in laminated glass panes. 4,705,721, Cl. 428-349.000.
Frizot, Alain; Cadaureille, Gerard; Lalere, Jean C.; and Machuron, Jean-Yves, to Framatome. Device for checking the vertical alignment of the upper and lower internal equipment of a pressurized water nuclear reactor. 4,704,801, Cl. 33-502.000.
Froehlich, Donell P.: *See—*
Christianson, Leslie L.; Alcock, Ralph; Froehlich, Donell P.; and Chicoine, Kellen J., 4,705,449, Cl. 414-68.500.
Frohlich, Alfons, to Opti Patent- Forschungs-und Fabrikations-AG. Process and apparatus for mounting a slide fastener near opposing edges of two pieces of material. 4,704,781, Cl. 29-408.000.
Frotschner, Eberhard; and Worner, Otto, to Daimler-Benz Aktiengesellschaft. Spoke arrangement for a hydrodynamic torque converter. 4,704,864, Cl. 60-330.000.
Fry, Timothy S., to Bartel Engineering Limited. Differential gear drive having two output shafts between which there is a limited speed ratio. 4,704,921, Cl. 74-714.000.
Frye, John G., Jr.: *See—*
Mazanec, Terry J.; Frye, John G., Jr.; and Hardman, Harley F., 4,705,532, Cl. 44-53.000.
Fucci, Joseph G., to TRW Inc. Quarter turn fastener. 4,705,442, Cl. 411-510.000.
Fuchizawa, Tetsuro: *See—*
Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, 4,705,746, Cl. 430-538.000.
Fuhrman, James L.: *See—*
Watson, George A.; Co, Ramon S.; Fuhrman, James L.; and Avella, Frank, 4,706,244, Cl. 370-69.100.
Fuji Electric Company, Ltd.: *See—*
Kanda, Atsushi; Kitani, Kazuo; and Shirai, Kiichirou, 4,705,102, Cl. 165-104.330.
Fuji Jukogyo Kabushiki Kaisha: *See—*
Kitade, Nobumitsu, 4,705,134, Cl. 180-233.000.
Morikawa, Koji, 4,704,996, Cl. 123-188.00M.
Fuji Photo Film Co., Ltd.: *See—*
Hirai, Hiroyuki; Sato, Kozo; Yabuki, Yoshiharu; and Kawata, Ken, 4,705,737, Cl. 430-203.000.
Kimura, Tsutomu; and Watanabe, Yukio, 4,705,953, Cl. 250-484.100.
Komiyama, Choji; and Oishi, Kengo, 4,706,148, Cl. 360-132.000.
Mihayashi, Keiji; and Takada, Shunji, 4,705,743, Cl. 430-385.000.
Sasaki, Noboru; and Takahashi, Koji, 4,705,744, Cl. 430-505.000.
Sato, Tadahisa; Kawagishi, Toshio; and Furutachi, Nobuo, 4,705,863, Cl. 548-262.000.
Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, 4,705,746, Cl. 430-538.000.
Yamada, Junichi, 4,706,129, Cl. 358-293.000.
Fuji Xerox Co., Ltd.: *See—*
Kume, Hiroshi, 4,706,246, Cl. 370-85.000.
Ogita, Akira; and Tanaka, Masaaki, 4,705,386, Cl. 355-4.000.
Fujihara, Takeo; Yamatani, Akira; Yamamoto, Masanori; and Kunimoto, Yuji, to House Food Industrial Company Limited. Erectable container. 4,705,209, Cl. 229-109.000.
Fujii, Tadashi; Yagami, Hiroyuki; Seo, Iwao; and Sasaki, Masahiro, to Terumo Kabushiki Kaisha; and Mitsubishi Petrochemical. Ultrasonic transducer and method of manufacturing same. 4,704,774, Cl. 29-25.350.
Fujii, Taisuke, to Nippon Steel Corporation. Method for cooling a metal strip in a continuous annealing furnace. 4,705,579, Cl. 148-142.000.
Fujii, Toshio: *See—*
Matsumoto, Yoshio; Fujii, Toshio; Shinohara, Yoshinao; and Fukuda, Kiyoshi, 4,705,828, Cl. 525-232.000.
Fujimi Kenmazai Kogyo Kabushiki Kaisha: *See—*
Senda, Tetsuji; and Baba, Takashi, 4,705,566, Cl. 106-3.000.
Fujimura, Satoshi: *See—*
Yoda, Kiyoshi; Itagaki, Hidenobu; and Fujimura, Satoshi, 4,706,028, Cl. 324-309.000.
Fujino, Akihiko: *See—*
Mukai, Hiromu; Yamaki, Toshio; Fujino, Akihiko; Izumi, Shuji; Nakai, Masaaki; and Taniguchi, Nobuyuki, 4,705,382, Cl. 354-412.000.
Fujio, Shunichi: *See—*
Ito, Toshio; Fujio, Shunichi; and Taya, Takeyoshi, 4,705,092, Cl. 164-34.000.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanada, Hideaki; and Kawabata, Kohji, 4,705,851, Cl. 540-215.000.
Ueda, Ikuo; and Kato, Masayuki, 4,705,787, Cl. 514-259.000.
Fujita, Hisayoshi: *See—*
Niwa, Kensuke; Fujita, Hisayoshi; Saito, Yoshihiko; Makihara, Hiroshi; Hashimoto, Ritsuo; Hoshi, Younosuke; and Murayama, Katsutoshi, 4,705,654, Cl. 261-128.000.
Fujiwara, Takayoshi: *See—*
Kodama, Mikio; Ito, Akitoshi; Yano, Motoichi; Fujiwara, Takayoshi; and Umeyama, Satoshi, 4,705,827, Cl. 525-67.000.

Fukasawa, Masatomo: *See*—
Yamada, Hirotada; Masai, Naruhito; Ueda, Sinji; Okuda, Takao; Fukasawa, Masatomo; Kato, Masuhiro; and Fukumura, Masataka, 4,705,784, Cl. 514-202.000.

Fukaya, Masaki: *See*—
Itabashi, Satoshi; Kawakami, Soichiro; Terada, Katsunori; Suzuki, Hideyuki; Furushima, Teruhiko; and Fukaya, Masaki, 4,705,598, Cl. 156-643.000.

Fukuda, Kiyoshi: *See*—
Matsumoto, Yoshio; Fujii, Toshio; Shinohara, Yoshinao; and Fukuda, Kiyoshi, 4,705,828, Cl. 525-232.000.

Fukuda, Tomoichi: *See*—
Nasu, Hisanori; Suzuki, Satoru; Yoshida, Hiroaki; Fukuda, Tomoichi; and Soeda, Eiichi, 4,706,192, Cl. 364-413.000.

Fukumi, Shigenobu: *See*—
Kamiya, Hiroshi; Iguchi, Takeshi; and Fukumi, Shigenobu, 4,705,206, Cl. 228-183.000.

Fukumitsu, Mikio: *See*—
Watanabe, Atsuo; and Fukumitsu, Mikio, 4,704,776, Cl. 29-132.000.

Fukumura, Masataka: *See*—
Yamada, Hirotada; Masai, Naruhito; Ueda, Sinji; Okuda, Takao; Fukasawa, Masatomo; Kato, Masuhiro; and Fukumura, Masataka, 4,705,784, Cl. 514-202.000.

Fukunaga, Yukio; Shibahata, Yasuji; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, to Nissan Motor Co., Ltd. Method of controlling vehicle. 4,705,130, Cl. 180-140.000.

Fukunaga, Yukio: *See*—
Shibahata, Yasuji; Fukunaga, Yukio; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,705,131, Cl. 180-140.000.

Fukuyama, Hiroomi, to Fanuc Ltd. Numerical control unit. 4,706,002, Cl. 318-568.000.

Fukuyama, Keiichi: *See*—
Okano, Tamon; Kumobayashi, Hidenori; Akutagawa, Susumu; Kiji, Jitsuo; Konishi, Hisatoshi; Fukuyama, Keiichi; and Shimano, Yasunobu, 4,705,895, Cl. 564-15.000.

Fukuzawa, Takeshi: *See*—
Hibino, Yoshitaka; Fukuzawa, Takeshi; Sato, Hiromitsu; and Asakura, Masahiko, 4,705,011, Cl. 123-589.000.

Fulflo Specialties Co., Inc., The: *See*—
Robinson, James L., 4,705,063, Cl. 137-315.000.

Funada, Fumiaki; Kuwagaki, Hiroshi; Yamamoto, Kunihiko; and Matsuura, Masataka, to Sharp Kabushiki Kaisha. Liquid crystal display cell and method for manufacturing thereof. 4,705,360, Cl. 350-344.000.

Funada, Fumiaki: *See*—
Hamada, Hiroshi; Nakazawa, Kiyoshi; Take, Hiroshi; Kimura, Naofumi; and Funada, Fumiaki, 4,706,173, Cl. 362-341.000.

Funada, Saburo; Yoda, Yoshiro; Yoshikawa, Shoji; Doi, Masanori; and Sugawara, Kazutake, to Olympus Optical Co., Ltd. Optical recording and reproducing apparatus. 4,706,232, Cl. 369-13.000.

Funk, Guido: *See*—
Warzelhan, Volker; Bachl, Robert; Ball, Wolfgang; Funk, Guido; and Laun, Martin, 4,705,835, Cl. 526-116.000.

Furstenwerth, Hauke; and Schundehutte, Karl H., to Bayer Aktiengesellschaft. Aminophenylbenzothiazoles. 4,705,861, Cl. 548-178.000.

Furukawa, Akihiro, to NEC Corporation. Code converting system and method for band compression of digital signals. 4,706,265, Cl. 375-122.000.

Furukawa Electric Co., Ltd., The: *See*—
Ikeda, Masakiyo; Kojima, Seiji; Kikuchi, Hiroshi; and Kashiwayanagi, Yuzo, 4,705,700, Cl. 437-231.000.

Furukawa, Yoshimi: *See*—
Kawamoto, Yoshimichi; Furukawa, Yoshimi; Hamada, Tetsuro; and Serizawa, Mitsuya, 4,705,135, Cl. 180-236.000.

Furushima, Teruhiko: *See*—
Itabashi, Satoshi; Kawakami, Soichiro; Terada, Katsunori; Suzuki, Hideyuki; Furushima, Teruhiko; and Fukaya, Masaki, 4,705,598, Cl. 156-643.000.

Furutachi, Nobuo: *See*—
Sato, Tadahisa; Kawagishi, Toshio; and Furutachi, Nobuo, 4,705,863, Cl. 548-262.000.

Futami, Toru: *See*—
Suzuki, Tadashi; Tomikashi, Minoru; Futami, Toru; and Sakagami, Atsushi, 4,706,245, Cl. 370-85.000.

G. D. Searle & Co.: *See*—
Masateru, Miyano; and Shone, Robert L., 4,705,871, Cl. 549-417.000.

Gadelle, Claude; and Petit, Herve , to Institut Francais du Petrole. Method for forming a fluid barrier by means of sloping drains, more especially in an oil field. 4,705,431, Cl. 405-267.000.

GAF Corporation: *See*—
Lewis, David F.; and Kuszewski, James R., 4,705,741, Cl. 430-333.000.
Lewis, David F., 4,705,742, Cl. 430-333.000.

Gage Industries, Inc.: *See*—
Gage, Jeffrey C., 4,705,172, Cl. 206-519.000.

Gage, Jeffrey C., to Gage Industries, Inc. Lid with orientation device. 4,705,172, Cl. 206-519.000.

Gahlau, Heinemann; Hoffmann, Manfred; and Seemann, Norbert, to Dr. Alois Stankiewicz GmbH. Sound insulation part for surfaces. 4,705,139, Cl. 181-290.000.

Galway, Charles R.: *See*—
Baker, Charles D.; Brimhall, Owen D.; and Galway, Charles R., 4,705,518, Cl. 623-14.000.

Ganczarczyk, Jerzy J., to University of Toronto Innovations Foundation, The. Waste water treatment. 4,705,638, Cl. 210-710.000.

Gandrud, Dale E.; and Gandrud, Ebenhard S., to Gandy Company. Granular applicator with interchangeable metering wheels. 4,705,220, Cl. 239-654.000.

Gandrud, Ebenhard S.: *See*—
Gandrud, Dale E.; and Gandrud, Ebenhard S., 4,705,220, Cl. 239-654.000.

Gandy Company: *See*—
Gandrud, Dale E.; and Gandrud, Ebenhard S., 4,705,220, Cl. 239-654.000.

Gano, John W., to Gradall Company, The. Single engine excavator with remote control. 4,705,450, Cl. 414-687.000.

Ganser, Hans G.; Kersten, Reinhard; Schafer, Rolf; and Stormberg, Hans P., to U.S. Philips Corporation. Method of operating a high-pressure metal vapor discharge lamp and circuit arrangement for carrying out this method. 4,705,991, Cl. 315-209.00R.

Ganz, Tomas: *See*—
Lehrer, Robert I.; Selsted, Michael E.; and Ganz, Tomas, 4,705,777, Cl. 514-12.000.

Gardeen, John A., to Consolidated Electric Co. Control panel structure for a liquid pumping station. 4,705,456, Cl. 417-7.000.

Gargano, William L. B. Ram air parachute with multiple pressure centers. 4,705,238, Cl. 244-145.000.

Garrett Corporation, The: *See*—
Joco, Fidel M., 4,705,463, Cl. 417-407.000.

Gaspar, Thomas A., to Ribbon Technology Corporation. Textured substrate and method for the direct, continuous casting of metal sheet exhibiting improved uniformity. 4,705,095, Cl. 164-463.000.

Gastaud, Michel: *See*—
Brunet, Henri; Mabru, Michel; and Gastaud, Michel, 4,706,257, Cl. 372-88.000.

Gastinger, Robert G., to Atlantic Richfield Company. Synthesis of N-halogenated phenyl maleimide compounds with tin containing catalysts. 4,705,866, Cl. 548-549.000.

Gates, Louis E., Jr.; Kamensky, Albert; and Devendorf, Don C., to Hughes Aircraft Company. Microelectronic package. 4,705,917, Cl. 174-52.0FP.

Gateway Industries, Inc.: *See*—
Doty, Gerald A., 4,705,230, Cl. 242-107.40A.

Gatto, Paul J. Mold and method of use. 4,704,840, Cl. 52-741.000.

Gauer, Glenn G. Framer. 4,704,796, Cl. 33-1.00B.

Gauer, Richard. Alpine ski. 4,705,291, Cl. 280-609.000.

Gazsi, Lajos: *See*—
Rainer, Alois; Ulbrich, Walter; and Gazsi, Lajos, 4,706,188, Cl. 364-200.000.

Gebruder Buhler AG: *See*—
Bruno, Gmur, 4,704,845, Cl. 53-482.000.

Geer, Ralph D.; Morgan, Robert L.; and Senek, Dexter S., to Republic Steel Corporation. Furnace for heating and melting zinc. 4,705,260, Cl. 266-78.000.

Geho, W. Blair; Lau, John R.; and Jacob, Joseph, to Technology Unlimited, Inc. Diarrheal antitoxin. 4,705,804, Cl. 514-474.000.

Geissler, Ulrich; and Albrecht, Klaus, to Hoechst Aktiengesellschaft. Radiation-polymerizable mixture, copolymer contained therein, and a process for the preparation of the copolymer. 4,705,740, Cl. 430-288.000.

Geke, Juergen: *See*—
Struve, Alfred; Upadek, Horst; and Geke, Juergen, 4,705,666, Cl. 422-16.000.

General Electric Company: *See*—
Crivello, James V., 4,705,887, Cl. 560-190.000.
Dumoulin, Charles L., 4,706,024, Cl. 324-309.000.
Hampton, Thomas G.; Mitsch, James M.; Palmieri, Joseph M.; Parker, David S.; and DeRosier, Donna C., 4,706,054, Cl. 335-203.000.
Howell, Edward K., 4,705,923, Cl. 200-144.00B.
Hoyle, William; and Graves, Jammie, 4,705,439, Cl. 409-136.000.
Lane, Kimberley J.; and Traver, Frank J., 4,705,704, Cl. 427-389.900.
Lewis, Larry N., 4,705,765, Cl. 502-152.000.
May, John E., 4,706,060, Cl. 338-20.000.
Pelc, Norbert J.; and Glover, Gary H., 4,706,026, Cl. 324-309.000.
Possin, George E.; Parks, Harold G.; and Piper, William W., 4,704,783, Cl. 437-40.000.
Ruterbusch, Paul H., 4,706,171, Cl. 362-254.000.
Thompson, James B.; and Junge, Brent A., 4,704,874, Cl. 62-187.000.
Todaro, Frank A.; and Dougherty, John J., 4,706,158, Cl. 361-92.000.
Viertl, John R. M.; and Auger, Mederic E., 4,706,020, Cl. 324-238.000.
White, Robert W., 4,705,974, Cl. 310-89.000.

General Electric Company, p.l.c., The: *See*—
Caunce, Benjamin R. J., 4,706,156, Cl. 361-80.000.

General Motors Corporation: *See*—
Schmitt, Fritz, 4,706,059, Cl. 337-297.000.

General Trailer Co.: *See*—
Schmidt, Kenneth J., 4,705,288, Cl. 280-405.00R.

Genestier, Gerard: *See*—
Besson, Raymond; Delaite, Richard; Genestier, Gerard; Maitre, Pierre; Renard, Georges; Thiebaud, Daniel; and Valentin, Jean-Pascal, 4,705,982, Cl. 310-356.000.

Geophysical Engineering Company: *See*—
Assaf, Gad, 4,704,993, Cl. 122-21.000.

Georgiev, Vassil S.; and Mullen, George B., to Pennwalt Corporation. Substituted α-[2'-tricyclo[3.3.1.1^{3,7}]decylidene]-benzeneacetic acid derivatives. 4,705,891, Cl. 562-491.000.

Geosource Inc.: *See*—
Mueller, Allan H.; and Perkins, Dean P., 4,706,231, Cl. 367-190.000.

Gerber, David W.; and Untch, Frederick M., to Babcock & Wilcox Company, The. Labyrinth articulation joint for regenerative air heater seal frame. 4,705,098, Cl. 165-4.000.

Gesellschaft fuer Strahlen-und Umweltsforschung Muenchen mbH (GSF): *See*—
Ebeling, Wolfgang; and Kolditz, Helmut, 4,705,120, Cl. 175-99.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Grundken, Dieter; Redder, Manfred; and Schewinski, Hartmut, 4,705,160, Cl. 198-735.000.

Ghaly, Azmy W. Coupling and clamping device. 4,705,305, Cl. 285-311.000.

Ghilardi, Giuliano, to Pirelli Coordinamento Pneumatici S.p.A. Tread-patterns of motor-vehicle tires. 4,705,088, Cl. 152-209.00R.

Giavarini, Andrea, to GTE Telecommunicazioni, S.p.A. Microwave metallic cavity. 4,706,053, Cl. 333-229.000.

Giba-Geigy Corporation: *See*—
Boast, Carl A., 4,705,781, Cl. 514-85.000.

Gibson, Gary S. Motorcycle chain drive. 4,705,494, Cl. 474-109.000.

Gibson, Phillip R.; and Richardson, Dean L. Trotline reel. 4,704,817, Cl. 43-57.300.

Giddings, Gary M., to Discovision Associates. Method and apparatus for recovering information from a videodisc. 4,706,133, Cl. 358-342.000.

Gilain, Jacques: *See*—
Vanlautem, Noel; and Gilain, Jacques, 4,705,604, Cl. 203-67.000.

Gilbert, Zachary R.; and Gorz, Richard A. Wheel-mounted weed trimmer. 4,704,849, Cl. 56-17.500.

Gilderdale, Aleta: *See*—
Hernandez, Jorge M.; and Gilderdale, Aleta, 4,706,162, Cl. 361-306.000.

Gill, William H. Cooking apparatus. 4,704,956, Cl. 99-427.000.

Gilligan, William H.: *See*—
Sitzmann, Michael E.; and Gilligan, William H., 4,705,899, Cl. 568-590.000.

Gilmer, William N., to Texaco Inc. Production of synthesis gas. 4,705,542, Cl. 55-93.000.

Gimpelson, George E.; Holbrook, Cheryl L.; and Hause, Frederick N., to Harris Corporation. Simultaneous plasma sculpturing and dual tapered aperture etch. 4,705,596, Cl. 156-643.000.

Gimpelson, George E.; Holbrook, Cheryl L.; and Rivoli, Anthony L., to Harris Corporation. Photoresist tapering process. 4,705,597, Cl. 156-643.000.

Giray, Guenes; Huthmacher, Klaus; Kleemann, Axel; and Lied, Thomas, to Degussa Aktiengesellschaft. Process for the production of 1,2-dithiolan-3-pentanoic acid (thioctic acid) and intermediate compounds therefor. 4,705,867, Cl. 549-39.000.

Girot, Michael C.: *See*—
Kay, Peter D.; and Girot, Michael C., 4,705,568, Cl. 106-26.000.

Giurtino, Joel F., to Cordis Corporation. Pacing system analyzer having provision for direct connection of pacer to pacing leads. 4,705,042, Cl. 128-419.0PT.

Givens, Thomas B., to Visitec Company. Parallax-free optical zone marker. 4,705,035, Cl. 128-303.00R.

GKN Automotive Components Inc.: *See*—
Krude, Werner, 4,705,128, Cl. 180-73.300.

Glajch, Joseph L.; and Kirkland, Joseph J., to Du Pont de Nemours, E. I., and Company. Substrates with sterically-protected, stable, covalently-bonded organo-silane films. 4,705,725, Cl. 428-405.000.

Glatter, Otto: *See*—
Spiess, Karl; Baberowski, Waldemar; and Glatter, Otto, 4,704,782, Cl. 29-434.000.

Glover, Gary H.: *See*—
Pelc, Norbert J.; and Glover, Gary H., 4,706,026, Cl. 324-309.000.

Glynwed Tubes and Fittings Limited: *See*—
Marklew, David S., 4,705,058, Cl. 137-15.000.

Go, Tiong C., to Irvine Sensors Corporation. High-density electronic modules—process and product. 4,706,166, Cl. 361-403.000.

Godsoe, Donald E., Jr.: *See*—
Godsoe, Donald E., Sr.; and Godsoe, Donald E., Jr., 4,705,136, Cl. 180-277.000.

Godsoe, Donald E., Sr.; and Godsoe, Donald E., Jr. Motor vehicle safety system. 4,705,136, Cl. 180-277.000.

Goebel, Ronald G. Plug safe. 4,705,335, Cl. 439-133.000.

Goedbloed, Willem: *See*—
Dieleman, Pieter J.; Goedbloed, Willem; De Jong, Roelof P.; and Oosterwijk, Theodorus M., 4,706,051, Cl. 333-212.000.

Goedemans, Wilhelmus T., to Mallinckrodt, Inc. Sterile radioactive indium-containing aqueous solution. 4,705,678, Cl. 424-1.100.

Goel, Anil B., to Ashland Oil, Inc. Acceleration of rate of cure in boron trifluoride amine catalyzed cure of epoxy resins. 4,705,838, Cl. 528-48.000.

Goers, George F., to United States of America, Energy. X, Y, Z positioner. 4,705,252, Cl. 248-178.000.

Goetz, Harry: *See*—
Lehmann, Klaus; Dreher, Dieter; and Goetz, Harry, 4,705,695, Cl. 427-3.000.

Goetz, Willi, to Valmet-Strecker GmbH. Device for automatically splicing a web of material in a web feeding apparatus. 4,705,226, Cl. 242-56.00R.

Goglio, Luigi, to Fres-Co System USA, Inc. Sealed flexible container with non-destructive peelable opening. 4,705,174, Cl. 206-632.000.

Gohler, Peter: *See*—
Fleischer, Klaus; Gohler, Peter; Mangler, Rolf; Reuther, Christian; Schingnitz, Manfred; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir; Fedotov, Vasilij; and Rodionov, Boris, 4,704,971, Cl. 110-264.000.

Goldblatt, Irwin L.; and Mendelson, Leah T., to Exxon Research and Engineering Company. Copper molybdenum salts as antioxidants. 4,705,641, Cl. 252-35.000.

Goldfeld, Emil; Harush, Shlomo; Takserman, Yuri; and Weiler, Shmuel, to State of Israel, Ministry of Defence, Israel Military Industries, The. Launcher for an optically guided, wire-controlled missile with improved electronic circuitry. 4,705,237, Cl. 244-3.120.

Goncalves, Antonin, to L'Oreal. Cosmetic container having variable product take-up. 4,705,053, Cl. 132-88.700.

Gondouin, Oliver M. Natural gas conversion process. 4,705,908, Cl. 585-500.000.

Gong, William: *See*—
Birk, John; Breu, Heinz; Gong, William; Morehouse, Charles C.; and Liebes, Sidney, Jr., 4,705,081, Cl. 140-147.000.

Goodman, Joseph J.: *See*—
Carter, Guy T.; Greenstein, Michael; Goodman, Joseph J.; Borders, Donald B.; Maiese, William M.; and Testa, Raymond T., 4,705,688, Cl. 424-122.000.

Goodyear Tire & Rubber Company, The: *See*—
Gozdiff, Michael, 4,705,161, Cl. 198-847.000.
Scriver, Richard M., 4,705,819, Cl. 523-351.000.

Gordon, Alan J.; Billington, Donald G.; Evans, Robert; and Bowman, David J., to Shandon Southern Products Limited. Centrifugation. 4,705,630, Cl. 210-361.000.

Gordon, Robert L.; and Kalberer, Roderick W., to International Paper Company. Pour spout for containers. 4,705,197, Cl. 206-604.000.

Gornowicz, Gerald A.; and Lee, Chi-Long, to Dow Corning Corporation. Novel aminohydrocarbyl-substituted ketoximosilanes. 4,705,877, Cl. 556-422.000.

Gornowicz, Gerald A.; and Lee, Chi-Long, to Dow Corning Corporation. Method for preparing aminohydrocarbyl-substituted ketoximosilanes. 4,705,878, Cl. 556-422.000.

Gorz, Richard A.: *See*—
Gilbert, Zachary R.; and Gorz, Richard A., 4,704,849, Cl. 56-17.500.

Goshima, Takahiro: *See*—
Hattori, Yoshiyuki; Nomura, Ken; Goshima, Takahiro; and Tanaka, Hitoshi, 4,705,492, Cl. 474-49.000.

Goss, Jack, to McNeilab, Inc. Disposable temperature probe for photoactivation patient treatment system. 4,705,498, Cl. 604-6.000.

Gottlieb, Milton: *See*—
Ryan, Frederick M.; Gottlieb, Milton; and Feldman, Donald W., 4,705,362, Cl. 350-372.000.

Goulart, Joseph F., to Chrysler Motors Corporation. Disc brakes. 4,705,145, Cl. 188-18.00A.

Goulbourne, Stephen. Detecting leaks in plumbing systems. 4,705,060, Cl. 137-102.000.

Gould Inc.: *See*—
Young, Peter L.; Cech, Jay; and Li, Kin, 4,705,606, Cl. 204-15.000.

Gozdiff, Michael, to Goodyear Tire & Rubber Company, The. Heat resistant belt. 4,705,161, Cl. 198-847.000.

GPAC, Inc.: *See*—
Natale, Anthony, 4,705,429, Cl. 405-128.000.

Gradall Company, The: *See*—
Fought, Gerald E., 4,705,295, Cl. 280-754.000.
Ganc, John W., 4,705,450, Cl. 414-687.000.

Gradl, Reinhard: *See*—
Schimmel, Gunther; Kowalski, Werner; Heymer, Gero; and Gradl, Reinhard, 4,705,529, Cl. 23-293.00R.

Graham, Patricia A.: *See*—
Cronch, Darell D.; Fisher, Richard T.; Graham, Patricia A.; and Passafiume, John E., 4,706,008, Cl. 318-696.000.

Grahn, Allen R.; and Astle, Lynn. Multicomponent force-torque sensor. 4,704,909, Cl. 73-862.040.

Graindorge, Philippe; Arditty, Herve ; and Lefevre, Herve , to Thomson-CSF. Device for measuring a nonreciprocal phase shift produced in a closed-loop interferometer. 4,705,399, Cl. 356-350.000.

Granzer, Ernold; and Kampe, Klaus-Dieter, to Hoechst Aktiengesellschaft. 4-amino-2-(imidazolidin-2-on-1-yl)-5-(3-trifluoromethylphenyllaminocarbonyl)pyrimidines for antithrombotic prophylaxis and treatment. 4,705,792, Cl. 514-275.000.

Graser, Franz; Langer, Werner; and Nowak, Reiner, to Robert Bosch GmbH. Electromagnetically actuatable valve. 4,705,210, Cl. 239-585.000.

Grasselli, Robert K.: *See*—
Tenhover, Michael A.; Harris, Jonathan H.; and Grasselli, Robert K., 4,705,610, Cl. 204-95.000.

Grasso's Koninklijke Machinefabrieken N.V.: *See*—
Thijssen, Henricus A. C., 4,705,624, Cl. 210-96.100.

Grate, John H.; Hamm, David R.; and Valentine, Donald H., to Cate[illegible]a Associates; and Haldor Topsoe. Carbonylation process. 4,70[illegible], Cl. 560-25.000.

Gratz, Matthias; Hans-Dieter, Schmalz; Stadler, Gerald; and Hildenbrandt, Lothar. Running surface construction for skis. 4,705,290, Cl. 280-604.000.

Graves, Jammie: *See*—
Hoyle, William; and Graves, Jammie, 4,705,439, Cl. 409-136.000.

Graziani, Gabriele: *See*—
Nardi, Dante; Leonardi, Amedeo; Graziani, Gabriele; and Bianchi, Giorgio, 4,705,797, Cl. 514-356.000.

Green, Gary S.: *See*—
Siskin, Michael; Brons, Glen B.; and Green, Gary S., 4,705,622, Cl. 208-289.000.
Green, Jerry T., to Tuftco Corporation. Yarn carrier holder. 4,705,231, Cl. 242-130.000.
Green, William G., to Dow Chemical Company, The. Magnesium calcium oxide composite. 4,705,561, Cl. 75-58.000.
Greenberg, Sherman: *See*—
Poeppel, Roger B.; Greenberg, Sherman; and Diercks, Dwight R., 4,705,563, Cl. 75-95.000.
Greenstein, Michael: *See*—
Carter, Guy T.; Greenstein, Michael; Goodman, Joseph J.; Borders, Donald B.; Maiese, William M.; and Testa, Raymond T., 4,705,688, Cl. 424-122.000.
Greenwood, David: *See*—
Baxter, Anthony G. W.; Bostock, Stephen B.; and Greenwood, David, 4,705,528, Cl. 8-641.000.
Gregg, James R.: *See*—
Bachmann, Henry C.; Brown, Omar L.; Fraze, Ermal C.; Wynn, David K.; and Gregg, James R., 4,704,887, Cl. 72-347.000.
Grego, Francesco: *See*—
Nerli, Giovanni; Grego, Francesco; Bottos, Roberto; and Ferro, Francesco, 4,704,859, Cl. 57-401.000.
Gregor, Harry P.; Dalven, Paul I.; Hildebrandt, James R.; Hodgins, Leonard T.; Laccetti, Anthony J.; and Shamir, Abraham. Biologically active acrylonitrile-based copolymeric membrane. 4,705,753, Cl. 435-180.000.
Gregory, Thomas D., to Dow Chemical Company, The. Solid polymer electrolyte and production method. 4,705,728, Cl. 429-192.000.
Gregory, Walter A., to Du Pont de Nemours, E. I., and Company. Aminomethyl oxooxazolidinyl benzenes useful as antibacterial agents. 4,705,799, Cl. 514-376.000.
Greider, C. Austin; and Berry, Timothy E., to Western International, Inc. Control mechanism for walk-behind mower. 4,704,847, Cl. 56-10.500.
Gresens, Harry, to Bruckner Trockentechnik GmbH & Co. KG. Apparatus for determining the timewise progress of the drying of a material sample. 4,704,806, Cl. 34-54.000.
Gretag Aktiengesellschaft: *See*—
Schaub, Heiner; and Burki, Peter, 4,705,376, Cl. 354-298.000.
Greyhawk Systems: *See*—
Harshberger, Robert P., Jr.; Loucks, Bryan E.; and Witte, Kenneth G., 4,705,996, Cl. 318-160.000.
Grieshaber, Herman R. Surgical blade cleaning device. 4,704,760, Cl. 15-218.100.
Grigsby, Robert A., Jr.; Dominguez, Richard J. G.; and Speranza, George P., to Texaco Inc. Reaction product of polyoxyalkylene polyamine and an aliphatic isocyanate. 4,705,814, Cl. 521-159.000.
Grimes, John W., II; Jennings, Hamlin; and Brown, Paul W., to United States of America, Commerce. Method and apparatus relating to specimen cells for scanning electron microscopes. 4,705,949, Cl. 250-440.100.
Grimes, Thomas L.; Roeland, Robert; and Schadewald, Frederic H., to Upjohn Company, The. Method for internally electropolishing tubes. 4,705,611, Cl. 204-129.100.
Grisolano, James M., Jr.: *See*—
Peyman, Gholam A.; and Grisolano, James M., Jr., 4,705,037, Cl. 128-305.000.
Grohe, Klaus; and Lammens, Robert, to Bayer Aktiengesellschaft. Solutions of lactic acid salts of piperazinylquinolone- and piperazinyl-azaquinolone-carboxylic acids. 4,705,789, Cl. 514-254.000.
Grohe, Klaus: *See*—
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Grois, Igor: *See*—
Margolin, Mark; and Grois, Igor, 4,705,352, Cl. 350-96.200.
Grolig, Johann: *See*—
Stammann, Gunter; Grolig, Johann; and Waldmann, Helmut, 4,705,843, Cl. 528-212.000.
Grombchevsky, Andrei; and Kerner, Aron. Matrix printer and inker for indefinite length articles. 4,705,415, Cl. 400-124.000.
Grommes, Helmut: *See*—
Dibowski, Gunter; and Grommes, Helmut, 4,705,223, Cl. 241-117.000.
Groshans, Michael J.: *See*—
Meier, Daniel A.; and Groshans, Michael J., 4,705,703, Cl. 427-239.000.
Gross, William H., to National Semiconductor Corporation. High accuracy tachometer circuit. 4,705,969, Cl. 307-519.000.
Groth, Edward J., Jr., to Motorola, Inc. Monopulse tracking system substantially free of externally generated noise. 4,706,093, Cl. 342-427.000.
Grothe, Horst; and Arnolds, Gerhard, to SMS Concast Inc. Distancing means for dummy bars in continuous casting apparatus. 4,705,094, Cl. 164-426.000.
Grumman Aerospace Corp.: *See*—
Black, Stephen J.; Hitzigrath, Richard; Rosenblatt, Arnold; and Grundy, Douglas H., 4,705,100, Cl. 165-40.000.
Markow, Edward G., 4,705,087, Cl. 152-5.000.
Grund, Andreas: *See*—
Deschler, Ulrich; Grund, Andreas; and Prescher, Guenter, 4,705,868, Cl. 549-215.000.
Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig Helland, Stiftung & Co. KG: *See*—
Eckstein, Karlheinz, 4,704,788, Cl. 29-603.000.
Grundken, Dieter; Redder, Manfred; and Schewinski, Hartmut, to Gewerkschaft Eisenhutte Westfalia. Scraper-chain conveyors for mineral mining. 4,705,160, Cl. 198-735.000.
Grundy, Douglas H.: *See*—
Black, Stephen J.; Hitzigrath, Richard; Rosenblatt, Arnold; and Grundy, Douglas H., 4,705,100, Cl. 165-40.000.
GTE Communication Systems: *See*—
Black, James B., 4,706,278, Cl. 379-242.000.
GTE Communication Systems Corporation: *See*—
Black, James B., 4,706,276, Cl. 379-242.000.
Black, James B., 4,706,279, Cl. 379-279.000.
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Black, James B., 4,706,277, Cl. 379-242.000.
GTE Laboratories Incorporated: *See*—
Lee, Kang I.; and Jopson, Harriet, 4,705,645, Cl. 252-500.000.
Su, Chin B.; Lanzisera, Vincent A.; and Freeman, Richard I., 4,706,253, Cl. 372-44.000.
GTE Products Corporation: *See*—
Kemp, Preston B., Jr.; Johnson, Walter A.; and Steigelman, James Q., 4,705,560, Cl. 75-0.50B.
Miller, Michael J., 4,705,559, Cl. 75-0.5AA.
GTE Telecommunicazioni, S.p.A.: *See*—
Giavarini, Andrea, 4,706,053, Cl. 333-229.000.
GTE Valenite: *See*—
Patterson, John H.; and Bernadic, Thomas J., 4,705,434, Cl. 407-114.000.
Gudymov, Ernest: *See*—
Fleischer, Klaus; Gohler, Peter; Mangler, Rolf; Reuther, Christian; Schingnitz, Manfred; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir; Fedotov, Vasilij; and Rodionov, Boris, 4,704,971, Cl. 110-264.000.
Guerard, Norbert: *See*—
Beneteau, Christian; and Guerard, Norbert, 4,704,762, Cl. 15-250.420.
Guerin, Stanislas P., to Thomson-CSF. Moving map display providing various shaded regions per altitude for aircraft navigation. 4,706,199, Cl. 364-460.000.
Guerra, Fernando G., to Fabricas Lucia, Antonio Betere, S.A. Device for securing slats to the frame of a bedspring. 4,704,751, Cl. 5-236.00R.
Guido, Jurgen; and Binzer, Norbert, to Guido, Jurgen. Injection line connection. 4,705,306, Cl. 285-332.000.
Gunawardena, D. R.: *See*—
Tullis, Barclay J.; Bailey, John S.; Gunawardena, D. R.; and Kaempf, Ulrich, 4,705,444, Cl. 414-226.000.
Guntert, Josef; Hafele, Walter; and Tschoke, Helmut, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,705,005, Cl. 123-500.000.
Gut, Edward B.; and Orrico, Mario M. V., to Honeywell Inc. Space static pressure control. 4,705,066, Cl. 137-486.000.
Gut, Martin: *See*—
Burke, Peter A.; Duering, Walter; and Gut, Martin, 4,705,181, Cl. 215-220.000.
Guy, Jon S.; Liu, Dean-Yuan; and Sholtis, Albert A., to Sanders Associates, Inc. Printhead mounting and movement control assembly. 4,705,414, Cl. 400-120.000.
H.F. Hanscom & Company, Inc.: *See*—
Hanscom, John F., 4,705,080, Cl. 140-93.00A.
Haarmann, Walter; and Bremer, Hans-Joachim, to Barry Wright Corporation. Constant angle shaft coupling. 4,705,489, Cl. 464-69.000.
Hackenberger, Alfred: *See*—
Nickels, Helmut; and Hackenberger, Alfred, 4,705,869, Cl. 549-317.000.
Hadley, Michael S.; and King, Francis D., to Beecham Group p.l.c. Azabicyclo[3.3.1]nonanes. 4,705,858, Cl. 546-112.000.
Haeda, Yoshio: *See*—
Itagaki, Masato; Kikuchi, Katsuaki; Nakayama, Susumu; Haeda, Yoshio; and Kawakami, Takashi, 4,704,792, Cl. 29-741.000.
Hafele, Walter: *See*—
Guntert, Josef; Hafele, Walter; and Tschoke, Helmut, 4,705,005, Cl. 123-500.000.
Hafner, Warren G., to Pitney Bowes Inc. Multiple power supply overcurrent protection circuit. 4,706,159, Cl. 361-93.000.
Hageniers, Omer L., to Diffracto Ltd. Triangulation data integrity. 4,705,395, Cl. 356-1.000.
Hager, Jeffrey J.: *See*—
Van Brunt, Michael K.; and Hager, Jeffrey J., 4,705,915, Cl. 174-35.00R.
Hagiri, Minoru, to Ricoh Company, Ltd. Thermosensitive image transfer medium. 4,705,774, Cl. 503-207.000.
Hagmann, Peter: *See*—
Becker, Erwin; Ehrfeld, Wolfgang; and Hagmann, Peter, 4,705,605, Cl. 204-11.000.
Hahn, Linus K. Gas cooker. 4,705,020, Cl. 126-41.00R.
Hahnke, Manfred; and Segal, Marcos, to Hoechst Aktiengesellschaft. Mixtures of water-soluble fiber-reactive dyes and use thereof for dyeing: dioxazine and disazo dyes. 4,705,524, Cl. 8-527.000.
Haigh, John; and Aylett, Martin R., to British Telecommunications. Etching method. 4,705,593, Cl. 156-635.000.
Haigh, Richard N., to Harbiuger Labs, Inc. Radiant heat vaporizing injector. 4,705,664, Cl. 420-18.000.
Hair, Michael L.; Lok, Kar P.; and Winnik, Francoise M., to Xerox Corporation. Ink jet compositions with insoluble dye complexes. 4,705,567, Cl. 106-20.000.

Hajimoto, Yoshioki: *See*—
Nojiri, Hidetoshi; Miyazawa, Seiichi; Hakamada, Isao; and Hajimoto, Yoshioki, 4,706,254, Cl. 372-46.000.

Hakamada, Isao: *See*—
Nojiri, Hidetoshi; Miyazawa, Seiichi; Hakamada, Isao; and Hajimoto, Yoshioki, 4,706,254, Cl. 372-46.000.

Haku, Hisao: *See*—
Nakashima, Yukio; Haku, Hisao; Watanabe, Kaneo; and Matsuoka, Tsugufumi, 4,705,912, Cl. 136-258.000.

Haland, Lars Y.: *See*—
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Haldor Topsoe: *See*—
Grate, John H.; Hamm, David R.; and Valentine, Donald H., 4,705,883, Cl. 560-25.000.

Halfacre, Mark A.: *See*—
Pan, David S.; Sarma, Kanak C.; Halfacre, Mark A.; Owens, Alexander H.; and Rosier, Brian K., 4,706,102, Cl. 357-23.500.

Halfpenny, Paul F., to Lockheed Corporation. Humidification face mask. 4,705,033, Cl. 128-201.130.

Hamada, Hiroshi; Nakazawa, Kiyoshi; Take, Hiroshi; Kimura, Naofumi; and Funada, Fumiaki, to Sharp Kabushiki Kaisha. Lighting apparatus. 4,706,173, Cl. 362-341.000.

Hamada, Tetsuro: *See*—
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Hamamatsu Photonics Kabushiki Kaisha: *See*—
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Hamazaki, Ryoji: *See*—
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Hamilton, Edwin J., Jr.: *See*—
Yang, Ren-Der; Hamilton, Edwin J., Jr.; and Taber, Larry D., 4,705,848, Cl. 530-399.000.

Hamilton Standard Controls, Inc.: *See*—
Prouty, Robert E.; and Cunningham, S. Michael, 4,706,037, Cl. 335-248.000.
Wilson, Larry E., 4,706,017, Cl. 324-127.000.

Hamilton, William C.: *See*—
Sasser, R. Garth; and Hamilton, William C., 4,705,748, Cl. 435-7.000.

Hamm, David R.: *See*—
Grate, John H.; Hamm, David R.; and Valentine, Donald H., 4,705,883, Cl. 560-25.000.

Hammerschmidt, Erich; Behre, Horst; Blank, Heinz U.; and Mayer, Dietmar, to Bayer Aktiengesellschaft. Tetra-alkali metal salts of chromotropic acid, a process for their isolation and their use. 4,705,652, Cl. 260-512.00C.

Hampel, Herbert J.: *See*—
Rabey, Alexander; and Hampel, Herbert J., 4,705,921, Cl. 200-50.00B.

Hampton, Thomas G.; Mitsch, James M.; Palmieri, Joseph M.; Parker, David S.; and DeRosier, Donna C., to General Electric Company. Thermal magnetic trip unit for molded case circuit breakers. 4,706,054, Cl. 335-203.000.

Hamstra, James R.; Koehler, Howard A.; Rusterholz, John T.; and Tanglin, David J., to Sperry Corporation. Local store for scientific vector processor. 4,706,191, Cl. 364-200.000.

Hanabe, Hiroshi: *See*—
Matsumoto, Susumu; Suzuki, Shigeru; Watanabe, Hisao; and Hanabe, Hiroshi, 4,705,554, Cl. 71-88.000.

Hanagan, Mary A., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,705,556, Cl. 71-90.000.

Hanechak, Edward S.; and Hanechak, Rita A. Fish filleting apparatus and method. 4,704,769, Cl. 17-46.000.

Hanechak, Rita A.: *See*—
Hanechak, Edward S.; and Hanechak, Rita A., 4,704,769, Cl. 17-46.000.

Hans-Dieter, Schmalz: *See*—
Gratz, Matthias; Hans-Dieter, Schmalz; Stadler, Gerald; and Hildenbrandt, Lothar, 4,705,290, Cl. 280-604.000.

Hanscom, John F., to H.F. Hanscom & Company, Inc. Bundle tying machine. 4,705,080, Cl. 140-93.00A.

Hansen, Jorgen. Electrical jack-plug. 4,705,485, Cl. 439-669.000.

Hansen, William D.: *See*—
Ammen, Mark E.; and Hansen, William D., 4,704,979, Cl. 114-98.000.

Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, to Janome Sewing Machine Co. Ltd. Upper and lower thread tension devices for sewing machine. 4,704,975, Cl. 112-238.000.

Hara, Youichi: *See*—
Yamamoto, Michihiro; Ozato, Yukinori; Tamura, Nobuhiko; Miyagishi, Akira; and Hara, Youichi, 4,705,786, Cl. 514-252.000.

Harada, Takashi: *See*—
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Harada, Yoshinori: *See*—
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Harbiuger Labs, Inc.: *See*—
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Harbolt, Bruce; Saake, James T.; and Jackson, Douglas J., to Union Oil Company of California. Apparatus for preparing sulfur particles having uniform size distribution. 4,705,432, Cl. 406-60.000.

Hardman, Harley F.: *See*—
Mazanec, Terry J.; Frye, John G., Jr.; and Hardman, Harley F., 4,705,532, Cl. 44-53.000.

Harland, Geoffrey, to STC plc. Digital telecommunication system. 4,706,242, Cl. 370-60.000.

Harmon, Eldred R., to Square D Company. Corona shield and transmission line provided with corona shields. 4,705,918, Cl. 174-73.00R.

Harmon, John P., to Hewlett Packard Company. Near-linear spring connect structure for flexible interconnect circuits. 4,706,097, Cl. 346-139.00C.

Harris Corporation: *See*—
Gimpelson, George E.; Holbrook, Cheryl L.; and Hause, Frederick N., 4,705,596, Cl. 156-643.000.
Gimpelson, George E.; Holbrook, Cheryl L.; and Rivoli, Anthony L., 4,705,597, Cl. 156-643.000.

Harris Graphics Corporation: *See*—
Herman, John L.; Dessert, Robert A.; and Punater, Dinesh G., 4,705,199, Cl. 226-95.000.

Harris, James E.: *See*—
Kawakami, James H.; Harris, James E.; Maresca, Louis M.; Robeson, Lloyd M.; and Cotter, Robert J., 4,705,822, Cl. 524-425.000.

Harris, Jonathan H.: *See*—
Tenhover, Michael A.; Harris, Jonathan H.; and Grasselli, Robert K., 4,705,610, Cl. 204-95.000.

Harry, Alan, to PA Consulting Services Limited. Postal franking machine. 4,705,417, Cl. 400-235.000.

Harshberger, Robert P., Jr.; Loucks, Bryan E.; and Witte, Kenneth G., to Greyhawk Systems. Apparatus for positioning a rotating element. 4,705,996, Cl. 318-160.000.

Hart, Ian J. Golf trolleys. 4,705,293, Cl. 280-641.000.

Hart, John E., Jr. Reverse osmosis water purifying system. 4,705,625, Cl. 210-110.000.

Hart, John H.; and Baker, Frederick J., to Vitalink Communications Corporation. Method and apparatus for bridging local area networks. 4,706,081, Cl. 340-825.030.

Hartley, David H.; and Sellers, Dick. Material mixing and spraying apparatus. 4,705,217, Cl. 239-142.000.

Hartmann, Georg; Wiedemann, Kurt; and Zimmer, Ernst, to KUKA Schweissanlangen; and Roboter GmbH. System of externally holding and guiding supply lines to moving implements of manipulators. 4,705,243, Cl. 248-51.000.

Hartshorn, Kevin, to Ingersoll-Rand Company. Ported-plate, fluid control valve. 4,705,068, Cl. 137-512.100.

Hartzell, Stephen L., to Du Pont de Nemours, E. I., and Company. Herbicidal pyrazolesulfonamides. 4,705,558, Cl. 71-92.000.

Harush, Shlomo: *See*—
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Haruta, Masahiro: *See*—
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Hasegawa, Mineo; and Ozaki, Kitao, to Kewpie Kabushiki Kaisha. Apparatus for collecting lysozyme from egg white by adsorption. 4,705,755, Cl. 435-316.000.

Hasegawa, Takashi: *See*—
Matsumura, Toshimi; Sumitani, Shinya; Hayakawa, Takahiro; Hasegawa, Takashi; and Sakakibara, Shuji, 4,705,000, Cl. 123-357.000.

Hashiguchi, Shinji; Kimata, Hisayuki; and Koga, Yukuo, to Hitachi Zosen Corp; and Kabushiki Kaisha Koden Seisakusho. Ship collision preventive aid apparatus. 4,706,090, Cl. 342-41.000.

Hashikawa, Atsushi; Kitagawa, Nozomi; and Kikuchi, Tetsuro, to Nippon Soken, Inc. Fuel injection control for diesel engine. 4,704,999, Cl. 123-299.000.

Hashimoto, Kunihiro: *See*—
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Hashimoto, Shintaro; Morita, Akitaka; and Tsuda, Hiroshi, to Sharp Kabushiki Kaisha. Speech synthesizer output device. 4,706,288, Cl. 381-51.000.

Hashimoto, Tamotsu: *See*—
Yamada, Koji; Hashimoto, Tamotsu; Naruse, Masao; Murayama, Yo; and Ninno, Hideki, 4,705,805, Cl. 514-548.000.

Hasler, Hans: *See*—
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Hassfurther, Karl: *See*—
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Hata, Takeki: *See*—
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Hatamian, Mehdi: *See*—
Budrikis, Zigmantas L.; Hatamian, Mehdi; Kubik, Peter S.; and Netravali, Arun N., 4,705,942, Cl. 250-227.000.

Hattori, Hiroyuki; and Morita, Akiyoshi, to Victor Company of Japan, Ltd. Circuit arrangement and method for moving characters superimposed on an image represented by a video signal. 4,706,075, Cl. 340-726.000.

Hattori, Jun; and Ishikawa, Youhei, to Murata Manufacturing Co., Ltd. Dielectric resonator. 4,706,052, Cl. 333-219.000.

Hattori, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Controller for movable robot for moving a work element through a continuous path. 4,706,204, Cl. 364-513.000.

Hattori, Tadashi: *See*—
Ohta, Minoru; Miura, Kazuhiko; Onoda, Michitoshi; Iwasaki, Yukio; and Hattori, Tadashi, 4,705,713, Cl. 428-209.000.

Hattori, Toshiaki; and Shimanuki, Machio, to Kabushiki Kaisha Toshiba. Magnetic disk apparatus. 4,706,142, Cl. 360-105.000.

Hattori, Yoshiyuki; Nomura, Ken; Goshima, Takahiro; and Tanaka, Hitoshi, to Nippondenso Co., Ltd. Automotive infinite transmission. 4,705,492, Cl. 474-49.000.

Hattori, Yoshiyuki: *See*—
Imoto, Yuzo; Takei, Toshihiro; Hattori, Yoshiyuki; Uno, Haruhiko; Inagaki, Mitsuo; and Takeda, Kenji, 4,705,323, Cl. 303-116.000.

Hauck, James P.: *See*—
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Hauck, Lane T. Switch actuated communication device. 4,706,067, Cl. 340-365.00R.

Hause, Frederick N.: *See*—
Gimpelson, George E.; Holbrook, Cheryl L.; and Hause, Frederick N., 4,705,596, Cl. 156-643.000.

Hautala, Jouko; and Pikkujamsa, Esa, to Oy Tampella AB. Thickener. 4,705,631, Cl. 210-403.000.

Havel, Karel. Electronic timepiece with physical transducer. 4,705,406, Cl. 368-10.000.

Hawkins, Joel W.; and Hawkins, Patrick G. Wheeled stand assembly. 4,705,264, Cl. 269-17.000.

Hawkins, Patrick G.: *See*—
Hawkins, Joel W.; and Hawkins, Patrick G., 4,705,264, Cl. 269-17.000.

Hayakawa, Kimiaki: *See*—
Tanioka, Hiroshi; Ogino, Yoshitaka; Inoue, Yutaka; Naito, Masataka; and Hayakawa, Kimiaki, 4,706,128, Cl. 358-286.000.

Hayakawa, Takahiro: *See*—
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Hayashi, Atsushi; Kuwabara, Kiyoharu; Sakai, Kohzo; and Ishino, Toshihiro, to Asahi Glass Company Ltd. High zirconia fused refractory product. 4,705,763, Cl. 501-103.000.

Hayashi, Shigeo, to Mitsubishi Denki Kabushiki Kaisha. Power conversion system. 4,706,178, Cl. 363-98.000.

Hayashi, Shigeru: *See*—
Kawai, Yoichi; Abe, Masaru; Yoshihara, Akio; Hayashi, Shigeru; and Sekiguchi, Katsumi, 4,705,818, Cl. 523-200.000.

Hayden Schweitzer Corp.: *See*—
Johnson, Jeffrey C.; Rothon, Stephen; and Slater, Andrew J., 4,704,952, Cl. 98-115.200.

Hayes, Earl J.; and Cooper, Ralph M., to AMP Incorporated. Sealed plug for a printed circuit board receptacle. 4,705,339, Cl. 439-277.000.

Hayes, Richard A., to Du Pont de Nemours, E. I., and Company. Polyimide gas separation membranes. 4,705,540, Cl. 55-16.000.

Hayes Separation, Inc.: *See*—
Hayes, William V.; and Turner, Albert H., 4,705,519, Cl. 623-16.000.

Hayes, William V.; and Turner, Albert H., to Hayes Separation, Inc. Repair material for use with bones. 4,705,519, Cl. 623-16.000.

Hazelden, David: *See*—
Burr, Kenneth J.; Smith, Laurence S.; and Hazelden, David, 4,704,899, Cl. 73-61.00R.

Hazeltine Corporation: *See*—
Torre, Frank M.; Crush, John F.; and Masak, Raymond J., 4,706,261, Cl. 375-27.000.
Vasile, Carmine F., 4,705,967, Cl. 307-304.000.

Healey, Robert. Printing machine. 4,704,962, Cl. 101-269.000.

Heard, Robert A. H., to Signfix Limited. Offset sign mounting. 4,705,253, Cl. 248-219.400.

Heat Exchanger Industries, Inc.: *See*—
Warner, Donald F., 4,705,101, Cl. 165-104.310.

Heck, Samuel C., to Sani-Fresh International, Inc. Valve apparatus for liquid dispensers. 4,705,195, Cl. 222-207.000.

Heck, Samuel C.: *See*—
Bokmiller, David J.; and Heck, Samuel C., 4,705,420, Cl. 401-145.000.

Hedgcoth, Virgil; and Arndt, Douglas C., to Identicator Corp. Plastic identity card capable of providing an inkless fingerprint and method of developing inkless prints on plastic card. 4,705,299, Cl. 283-68.000.

Hedlund, Jan-Gunnar, to Santrade Limited. Device for supplying fluid to a tool for breaking hard material. 4,705,321, Cl. 299-81.000.

Hedlund, Martin L., to Boliden Aktiebolag. Method for working-up waste products containing valuable metals. 4,705,562, Cl. 75-83.000.

Heggenstaller, Anton. Device for compression molding of sections with a constant cross-section consisting of vegetable particles. 4,705,472, Cl. 425-261.000.

Heidl, Stephen C.: *See*—
Stackhouse, David W.; and Heidl, Stephen C., 4,705,653, Cl. 261-111.000.

Heikkila , Risto M.: *See*—
Honkaniemi, Matti E.; Mustikka, Lauri A.; Jankkila, Martti J.; Hokkanen, Pentti O.; Heikkila , Risto M.; and Lilja, Launo L., 4,705,474, Cl. 432-14.000.

Heimbigner, Thomas: *See*—
Tsui, Gary; and Heimbigner, Thomas, 4,705,422, Cl. 403-60.000.

Heller, Harold; Lange, Peter M.; and Martinola, Friedrich, to Bayer Aktiengesellschaft. Process for reducing the wash water requirement of weakly basic anion exchangers. 4,705,637, Cl. 210-670.000.

Helms, Howard D., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Technique for the operational life test of microprocessors. 4,706,208, Cl. 364-580.000.

Hempling, Norman G.: *See*—
Avila, Louis J.; Merritt, John E.; and Hempling, Norman G., 4,706,047, Cl. 332-19.000.

Hendricks, Udo W.; and Schmidt, Adolf, to Bayer Aktiengesellschaft. Aminosuccinic acid derivatives and their use as emulsifiers for polymer dispersions. 4,705,889, Cl. 562-564.000.

Hendry, Lawrence B.; Diamond, Ana H.; Diamond, Bruce I.; and Ewing, Douglas E., to Stereochemical Genetics, Inc. Use of 3-N-phenylacetylamino-2,6-piperidinedione for treatment of neuropsychiatric disorders. 4,705,796, Cl. 514-328.000.

Hengstler Bauelemente GmbH: *See*—
Seeger, Gunter A.; and Reger, Arno, 4,705,922, Cl. 200-61.45M.

Henke, Michael D.: *See*—
Barclay, John A.; Stewart, Walter F.; Henke, Michael D.; and Kalash, Kenneth E., 4,704,871, Cl. 62-3.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Moeller, Hinrich; and Zeidler, Ulrich, 4,705,682, Cl. 424-70.000.
Struve, Alfred; Upadek, Horst; and Geke, Juergen, 4,705,666, Cl. 422-16.000.

Hennessy, James W.; Angel, Henry R.; and Carlson, Richard A., to Nova Celltrak, Inc. Count accuracy control means for a blood analyses system. 4,706,207, Cl. 364-555.000.

Henri, Denis R. Container for truck platform. 4,705,317, Cl. 296-37.600.

Henry, Richard D. Trustworthy simplified vacuum systems. 4,705,233, Cl. 244-1.00R.

Hepp, Wolfgang: *See*—
Chaussy, Christian; Hepp, Wolfgang; van Rijn, Dick; and Forssmann, Bernd, 4,705,026, Cl. 128-24.00A.

Herdeg, Donald F.; and Poirier, Bruce A., to USM Corp. Automatic sewing machine system. 4,704,974, Cl. 112-121.120.

Herman, John L.; Dessert, Robert A.; and Punater, Dinesh G., to Harris Graphics Corporation. Vacuum drum for securing a film thereto. 4,705,199, Cl. 226-95.000.

Herman, Thomas: *See*—
Lidow, Alexander; and Herman, Thomas, 4,705,759, Cl. 437-29.000.

Hernandez, Jorge M.; and Gilderdale, Aleta, to Rogers Corporation. Multilayer capacitor elements. 4,706,162, Cl. 361-306.000.

Herst, Douglas J.; and Iwahashi, Henry H., to Peerless Lighting Corporation. Lighting fixture hanger unit for a modular lighting system. 4,706,170, Cl. 362-217.000.

Herzog, Kurt; and Schuler, Roland, to BBC Brown, Boveri & Company, Limited. Process for production of the winding of an electrical machine. 4,704,787, Cl. 29-596.000.

Hespelt, Achim; and v. d. Ohe, Manfred, to Daimler-Benz Aktiengesellschaft. Independent wheel suspension for steerable wheels of motor vehicles. 4,705,292, Cl. 280-660.000.

Hevoyan, Varoujan H. Wall switch extension operator. 4,705,924, Cl. 200-331.000.

Hewitt, David P.: *See*—
DuVall, Dale R.; Bateson, John E.; Hewitt, Lew V.; and Hewitt, David P., 4,706,227, Cl. 367-96.000.

Hewitt, Lew V.: *See*—
DuVall, Dale R.; Bateson, John E.; Hewitt, Lew V.; and Hewitt, David P., 4,706,227, Cl. 367-96.000.

Hewlett-Packard Company: *See*—
Birk, John; Breu, Heinz; Gong, William; Morehouse, Charles C.; and Liebes, Sidney, Jr., 4,705,081, Cl. 140-147.000.
Harmon, John P., 4,706,097, Cl. 346-139.00C.
Sheats, James R., 4,705,729, Cl. 430-5.000.
Tullis, Barclay J.; Bailey, John S.; Gunawardena, D. R.; and Kaempf, Ulrich, 4,705,444, Cl. 414-226.000.

Heymer, Gero: *See*—
Schimmel, Gunther; Kowalski, Werner; Heymer, Gero; and Gradl, Reinhard, 4,705,529, Cl. 23-293.00R.

Hibino, Takeshi: *See*—
Nakano, Akihiko; Hibino, Takeshi; Takata, Hajime; and Yoshida, Manabu, 4,705,911, Cl. 136-251.000.

Hibino, Yoshitaka; Fukuzawa, Takeshi; Sato, Hiromitsu; and Asakura, Masahiko, to Honda Giken Kogyo Kabushiki Kaisha. Air intake side secondary air supply system for an internal combustion engine with an improved operation for a large amount of the secondary air. 4,705,011, Cl. 123-589.000.

Hiejima, Kiyoshi: *See*—
Sakai, Haruo; and Hiejima, Kiyoshi, 4,705,926, Cl. 219-10.55B.

Higgins, Larry, to Leggett & Platt, Incorporated. Bedding coil spring unit and assembly method. 4,705,079, Cl. 140-3.0CA.

Higgins, Ronald D.: *See*—
Barbare, Walter L.; Willey, Harley M.; and Higgins, Ronald D., 4,706,280, Cl. 379-284.000.

Higgs, Jacob K., to Sprague Electric Company. Integrated circuit hall switch with adjustable operate point. 4,705,964, Cl. 307-278.000.

Highland Import Corporation: *See*—
Bianchini, William L.; and Duclos, Gary P., 4,704,808, Cl. 36-102.000.

Higuchi, Hideyo: *See*—
Shiba, Tetsuo; Takahashi, Kazuhisa; Ikeda, Kenji; and Higuchi, Hideyo, 4,706,106, Cl. 357-78.000.

Hildebrandt, James R.: *See*—
Gregor, Harry P.; Dalven, Paul I.; Hildebrandt, James R.; Hodgins, Leonard T.; Laccetti, Anthony J.; and Shamir, Abraham, 4,705,753, Cl. 435-180.000.
Hildenbrandt, Lothar: *See*—
Gratz, Matthias; Hans-Dieter, Schmalz; Stadler, Gerald; and Hildenbrandt, Lothar, 4,705,290, Cl. 280-604.000.
Hill, Gary R. Method and machine for splining clutch hubs with close tolerance spline bellmouth and oil seal surface roundness. 4,705,150, Cl. 192-70.200.
Hill, Ralph P. Cryogenic refrigeration system. 4,704,876, Cl. 62-388.000.
Hillemann, Craig L., to Du Pont de Nemours, E. I., and Company. Herbicidal triazines. 4,705,555, Cl. 71-90.000.
Hilligoss, Lawrence O.; and Hilligoss, William R., to Communications Technology Corporation. Communication lines with terminate and leave capability-DC alarm bridge. 4,706,271, Cl. 379-49.000.
Hilligoss, William R.: *See*—
Hilligoss, Lawrence O.; and Hilligoss, William R., 4,706,271, Cl. 379-49.000.
Himmele, Walter: *See*—
Buschmann, Ernst; Himmele, Walter; Eckhardt, Heinz; Ernst, Hansgeorg; Rademacher, Wilhelm; and Jung, Johann, 4,705,553, Cl. 71-76.000.
Hinton, Harvard S.; and Ostrander, John L., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical interconnection arrangement. 4,705,344, Cl. 350-3.730.
Hirabayashi, Yasuyuki; and Sugiura, Juro, to TDK Corporation. Erasing head. 4,706,145, Cl. 360-118.000.
Hiraga, Yuji; and Ito, Tatsuya, to Sharp Kabushiki Kaisha. Developing apparatus. 4,705,383, Cl. 355-3.0DD.
Hirai, Hiroyuki; Sato, Kozo; Yabuki, Yoshiharu; and Kawata, Ken, to Fuji Photo Film Co., Ltd. Heat developable photographic materials. 4,705,737, Cl. 430-203.000.
Hirai, Yutaka: *See*—
Eguchi, Ken; Nishimura, Yukuo; Haruta, Masahiro; Matsuda, Hiroshi; Hirai, Yutaka; and Nakagiri, Takashi, 4,705,403, Cl. 356-319.000.
Hiramoto, Kazuo: *See*—
Michiguchi, Yoshihiro; Takahashi, Fuminobu; Hiramoto, Kazuo; Nishi, Masatsugu; and Sonoda, Shinji, 4,706,031, Cl. 324-337.000.
Hirano, Akihiro: *See*—
Tsuji, Katsuya; Tanimoto, Masahiro; Hirano, Akihiro; and Yamada, Takeshi, 4,705,669, Cl. 422-93.000.
Hirao, Tadashi: *See*—
Suda, Kakutaro; and Hirao, Tadashi, 4,705,599, Cl. 156-653.000.
Hird, Edwin A. Measurement digitizer. 4,704,798, Cl. 33-138.000.
Hirosawa, Makoto, to Dainippon Screen Mfg. Co., Ltd. Cutting reproduction images out of a sheet of exposed film. 4,704,927, Cl. 83-13.000.
Hirose, Fumiyuki: *See*—
Iizuka, Nobuyuki; Hirose, Fumiyuki; Sato, Isao; and Ishibashi, Yoji, 4,704,869, Cl. 60-751.000.
Hiroshima, Mochisuke: *See*—
Kasahara, Shuhei; and Hiroshima, Mochisuke, 4,705,390, Cl. 355-52.000.
Hirota, Fumiyuki; Miwa, Tadashi; and Yamada, Yasushi, to Konishiroku Photo Industry Co., Ltd. Automatic sheet feeding apparatus. 4,705,265, Cl. 271-122.000.
Hirota, Jitsuho; Machida, Kazumichi; and Watanabe, Noriko, to Mitsubishi Denki Kabushiki Kaisha. Method of ball forming for wire bonding. 4,705,204, Cl. 228-179.000.
Hiroyasu, Fujikawa, to Kanda Tekko Kabushiki Kaisha. Transfer system for vehicles. 4,704,917, Cl. 74-475.000.
Hitachi Cable, Ltd.: *See*—
Ito, Motoya; Takahashi, Noriyoshi; Watanabe, Masatoshi; Abukawa, Toshimi; Seya, Takeshi; Kainuma, Hiroshi; and Syutoo, Toshiyuki, 4,704,789, Cl. 29-609.000.
Hitachi Koki Company, Limited: *See*—
Nishimura, Hiroshi; and Miyasaka, Masao, 4,704,963, Cl. 101-425.000.
Hitachi, Ltd.: *See*—
Arai, Yoshinao; Takahashi, Shino; Oikawa, Eigo; Sato, Shigeru; and Kobayashi, Hideaki, 4,706,187, Cl. 364-191.000.
Iizuka, Nobuyuki; Hirose, Fumiyuki; Sato, Isao; and Ishibashi, Yoji, 4,704,869, Cl. 60-751.000.
Itagaki, Masato; Kikuchi, Katsuaki; Nakayama, Susumu; Haeda, Yoshio; and Kawakami, Takashi, 4,704,792, Cl. 29-741.000.
Ito, Motoya; Takahashi, Noriyoshi; Watanabe, Masatoshi; Abukawa, Toshimi; Seya, Takeshi; Kainuma, Hiroshi; and Syutoo, Toshiyuki, 4,704,789, Cl. 29-609.000.
Kosugi, Tetsuo, 4,705,761, Cl. 501-87.000.
Masuda, Masachika; and Murakami, Gen, 4,706,105, Cl. 357-74.000.
Michiguchi, Yoshihiro; Takahashi, Fuminobu; Hiramoto, Kazuo; Nishi, Masatsugu; and Sonoda, Shinji, 4,706,031, Cl. 324-337.000.
Ohtaka, Tadashi, 4,705,950, Cl. 250-441.100.
Okudaira, Sadayuki; Nishimatsu, Shigeru; Suzuki, Keizo; Ninomiya, Ken; and Hamazaki, Ryoji, 4,705,595, Cl. 156-643.000.
Takenaka, Takaji; Watanabe, Hideki; and Imada, Haruhiko, 4,706,165, Cl. 361-403.000.
Hitachi Maxell, Ltd.: *See*—
Kitahata, Shinichi; and Kishimoto, Mikio, 4,705,718, Cl. 428-323.000.
Hitachi Microcomputer Engineering Co., Ltd.: *See*—
Takenaka, Takaji; Watanabe, Hideki; and Imada, Haruhiko, 4,706,165, Cl. 361-403.000.
Hitachi Software Engineering Co., Ltd.: *See*—
Nasu, Hisanori; Suzuki, Satoru; Yoshida, Hiroaki; Fukuda, Tomoichi; and Soeda, Eiichi, 4,706,192, Cl. 364-413.000.
Hitachi Zosen Corp: *See*—
Hashiguchi, Shinji; Kimata, Hisayuki; and Koga, Yukuo, 4,706,090, Cl. 342-41.000.
Hitzigrath, Richard: *See*—
Black, Stephen J.; Hitzigrath, Richard; Rosenblatt, Arnold; and Grundy, Douglas H., 4,705,100, Cl. 165-40.000.
Hlavka, Lloyd F., to Varian Associates, Inc. Pulsed gas control for NMR spinner speed adjustment. 4,706,029, Cl. 324-321.000.
Ho, Teh C.: *See*—
McCandlish, Larry E.; and Ho, Teh C., 4,705,619, Cl. 208-112.000.
Hobart Corporation: *See*—
Treiber, Fritz F., 4,705,588, Cl. 156-360.000.
Hobson, Phillip M.: *See*—
Layman, Frederick P.; Huntley, David A.; Dick, Paul H.; Coad, George L.; Kuhlman, Michael J.; Vecta, Roger M.; and Hobson, Phillip M., 4,705,951, Cl. 250-442.100.
Hoda, Masakazu: *See*—
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Hodgins, Leonard T.: *See*—
Gregor, Harry P.; Dalven, Paul I.; Hildebrandt, James R.; Hodgins, Leonard T.; Laccetti, Anthony J.; and Shamir, Abraham, 4,705,753, Cl. 435-180.000.
Hoechst AG: *See*—
Just, Christoph; Plath, Dieter; and Walz, Gerd, 4,705,885, Cl. 560-158.000.
Hoechst Aktiengesellschaft: *See*—
Espenschied, Bernd; and Klein, Peter, 4,705,844, Cl. 528-275.000.
Geissler, Ulrich; and Albrecht, Klaus, 4,705,740, Cl. 430-288.000.
Granzer, Ernold; and Kampe, Klaus-Dieter, 4,705,792, Cl. 514-275.000.
Hahnke, Manfred; and Segal, Marcos, 4,705,524, Cl. 8-527.000.
Ohlendorf, Dieter; Hoffmann, Heinz; Interthal, Werner; and Pintschovius, Ulrich, 4,705,860, Cl. 546-347.000.
Penina-Surinach, Pere, 4,705,754, Cl. 435-287.000.
Ressel, Herbert; and Westphal, Wilhelm, 4,705,671, Cl. 422-189.000.
Schimmel, Gunther; Kowalski, Werner; Heymer, Gero; and Gradl, Reinhard, 4,705,529, Cl. 23-293.00R.
Spietschka, Ernst; and Urban, Manfred, 4,705,572, Cl. 106-288.00Q.
Hoeymakers, Gerardus M.: *See*—
Peeters, Hendrikus W. J.; van Kuringen, Hendricus M. J. C.; and Hoeymakers, Gerardus M., 4,705,391, Cl. 355-77.000.
Hoffman, Charles W. Handle construction for long handled implements. 4,704,758, Cl. 15-144.00B.
Hoffmann, Gerhard, to Daimler-Benz Aktiengesellschaft. Electrode arrangement for the electrochemical metal erosion process for producing a tooth system. 4,705,615, Cl. 204-289.000.
Hoffmann, Heinz: *See*—
Ohlendorf, Dieter; Hoffmann, Heinz; Interthal, Werner; and Pintschovius, Ulrich, 4,705,860, Cl. 546-347.000.
Hoffmann, Manfred: *See*—
Gahlau, Heinemann; Hoffmann, Manfred; and Seemann, Norbert, 4,705,139, Cl. 181-290.000.
Hofrichter, James, to Seats, Inc. Swivel seat pedestal. 4,705,256, Cl. 248-418.000.
Hokkanen, Pentti O.: *See*—
Honkaniemi, Matti E.; Mustikka, Lauri A.; Jankkila, Martti J.; Hokkanen, Pentti O.; Heikkila , Risto M.; and Lilja, Launo L., 4,705,474, Cl. 432-14.000.
Holbrook, Cheryl L.: *See*—
Gimpelson, George E.; Holbrook, Cheryl L.; and Hause, Frederick N., 4,705,596, Cl. 156-643.000.
Gimpelson, George E.; Holbrook, Cheryl L.; and Rivoli, Anthony L., 4,705,597, Cl. 156-643.000.
Hollenstein, Helmut: *See*—
Rock, Erich; and Hollenstein, Helmut, 4,705,328, Cl. 312-330.00R.
Holmes, Rory: *See*—
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Holzer, Gerhard: *See*—
Frisch, Kurt C.; Klempner, Daniel; Radisch, Helmer; and Holzer, Gerhard, 4,705,721, Cl. 428-349.000.
Holznagel, Melvin A. Portable traffic signal. 4,706,087, Cl. 340-908.000.
Honda: *See*—
Yoshida, Takao, 4,705,285, Cl. 280-279.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hibino, Yoshitaka; Fukuzawa, Takeshi; Sato, Hiromitsu; and Asakura, Masahiko, 4,705,011, Cl. 123-589.000.
Kawamoto, Yoshimichi; Furukawa, Yoshimi; Hamada, Tetsuro; and Serizawa, Mitsuya, 4,705,135, Cl. 180-236.000.
Kurata, Noboru, 4,704,920, Cl. 74-665.0GC.
Matsuura, Kazuo; Yoshioka, Hiroshi; and Koga, Kiyoshi, 4,705,263, Cl. 267-33.000.
Honda Giken Kogyo Kaibushiki Kaisha: *See*—
Kawanabe, Tomohiko; Asakura, Masahiko; Kushida, Noritaka; Shiina, Takanori; and Muroya, Minoru, 4,705,012, Cl. 123-589.000.
Honda, Toshio; and Nishimura, Kosuke, to Sharp Kabushiki Kaisha. Card-type data terminal operatively connectable to electronic apparatus. 4,705,211, Cl. 235-380.000.

Honegger, Werner, to Ferag AG. Apparatus for winding-up and unwinding continuously arriving flexible flat structures. 4,705,227, Cl. 242-59.000.

Honeyager, Richard J.: *See—*
Schaefer, David V.; and Honeyager, Richard J., 4,704,777, Cl. 29-148.300.

Honeywell Inc.: *See—*
Gut, Edward B.; and Orrico, Mario M. V., 4,705,066, Cl. 137-486.000.
Johnson, Robert G., 4,706,061, Cl. 338-34.000.
Kovacic, Charles R.; and Noshay, David A., 4,706,065, Cl. 340-303.000.
Payne, Peter, 4,704,912, Cl. 74-89.150.
Tufte, Obert N., 4,706,100, Cl. 357-16.000.

Honkaniemi, Matti E.; Mustikka, Lauri A.; Jankkila, Martti J.; Hokkanen, Pentti O.; Heikkila , Risto M.; and Lilja, Launo L., to Outokumpu Oy. Method and apparatus for batch preparation and feeding into the smelting process. 4,705,474, Cl. 432-14.000.

Honkura, Yoshinobu; Murata, Kouji; and Yokoyama, Takashi, to Aichi Steel Works, Ltd. Soft magnetic stainless steel. 4,705,581, Cl. 148-307.000.

Hooven, Michael D., to Cordis Corporation. Implantable servo valve having integral pressure sensor. 4,705,499, Cl. 604-9.000.

Hopfensperger, Reinhold, to Alcatel N.V. Tangential blower. 4,705,453, Cl. 415-119.000.

Hopkins, Glen W.: *See—*
Hu, Min-Hsiung; and Hopkins, Glen W., 4,704,994, Cl. 122-32.000.

Horiba, Ltd.: *See—*
Tsuji, Katsuya; Tanimoto, Masahiro; Hirano, Akihiro; and Yamada, Takeshi, 4,705,669, Cl. 422-93.000.

Hornack, Thomas R.; and Brown, Melvin H., to Aluminum Company of America. Wire brush heat exchange insert and method. 4,705,106, Cl. 165-179.000.

Horner, Tommy D. Punch tool grinder and method. 4,704,824, Cl. 51-281.00R.

Horng, Jin-Shan. Chain breakdown safety device for a power-driven roller door. 4,704,914, Cl. 74-411.500.

Horst, Rathert, to Kolbus GmbH & Co. KG. Bookbinding method and apparatus. 4,704,973, Cl. 112-21.000.

Horvath nee Feher, Eva: *See—*
Madi-Szabo, Laszlo ; Morvai, Margit; Horvath nee Feher, Eva; Jansco, Sandor; Tamasi, Piroska; Kovacs, Istvan; Kiss nee Loss, Ilona Maria; Bacsa, Gyorgy; Kubala nee Papp, Maria; and Bene nee Horvath, Magdolna, 4,705,779, Cl. 514-27.000.

Horwell, David C.; and Timms, Graham H., to Lilly Industries Limited. Amine derivatives. 4,705,807, Cl. 514-650.000.

Hoshi, Younosuke: *See—*
Niwa, Kensuke; Fujita, Hisayoshi; Saito, Yoshihiko; Makihara, Hiroshi; Hashimoto, Ritsuo; Hoshi, Younosuke; and Murayama, Katsutoshi, 4,705,654, Cl. 261-128.000.

Hosokawa, Yoshiteru: *See—*
Asada, Takafumi; Yoshida, Cyuryo; Shioyama, Tadao; and Hosokawa, Yoshiteru, 4,706,144, Cl. 360-107.000.

Hotaling, Robert A.: *See—*
Weir, Donald H.; Frederick, Stanley H.; Hotaling, Robert A.; and Robol, Ronald B., 4,705,629, Cl. 210-340.000.

Houghtaling, Steven W., to Azygous. Seismic line amplifier. 4,706,226, Cl. 367-66.000.

House Food Industrial Company Limited: *See—*
Fujihara, Takeo; Yamatani, Akira; Yamamoto, Masanori; and Kunimoto, Yuji, 4,705,209, Cl. 229-109.000.

Hoverman, Ronald B.: *See—*
Robidoux, Richard R.; and Hoverman, Ronald B., 4,706,033, Cl. 328-139.000.

Howard, Fred; and Edson, Sydney, to Sara Lee Corporation. Display and pull-out tray assemblies for integrated modular store fixture system. 4,705,175, Cl. 211-59.200.

Howell, Edward K., to General Electric Company. Low voltage vacuum circuit interrupter. 4,705,923, Cl. 200-144.00B.

Howell, Jerald A.; and Kukes, Simon G., to Phillips Petroleum Company. Mixture of a molybdenum carboxylate and a molybdenum dithiophosphate or a molybdenum dithiocarbamate for use in a hydrovisbreaking process. 4,705,766, Cl. 502-167.000.

Hoyle, William; and Graves, Jammie, to General Electric Company. Machine tool collet containing means for passing a cutting fluid therethrough. 4,705,439, Cl. 409-136.000.

Hu, Min-Hsiung; and Hopkins, Glen W., to Westinghouse Electric Corp. Flow boosting and sludge managing system for steam generator tube sheet. 4,704,994, Cl. 122-32.000.

Hubele, Adolf; and Eckhardt, Wolfgang, to CIBA-GEIGY Corporation. N-(2-nitrophenyl)-4-aminopyrimidine microbicides. 4,705,790, Cl. 514-269.000.

Huber, Erich: *See—*
Wentzel, Peter; Huber, Erich; Weiss, Eckardt; and Achatz, Florian, 4,706,136, Cl. 360-39.000.

Huels Aktiengesellschaft: *See—*
Balzer, Dieter, 4,705,110, Cl. 166-274.000.

Hughes Aircraft Company: *See—*
Cargille, Donald R., 4,705,946, Cl. 250-338.000.
DuPont, Preston S.; Ritter, Robert E.; and Stafford, John P., 4,705,646, Cl. 252-511.000.
Ellerbroek, Brent L.; and Cohn, Brian D., 4,705,400, Cl. 356-353.000.
Gates, Lewis E., Jr.; Kamensky, Albert; and Devendorf, Don C., 4,705,917, Cl. 174-52.0FP.
Ranganath, Tirumala R., 4,706,103, Cl. 357-30.000.
Simons, David R., 4,705,343, Cl. 350-1.300.
von der Embse, U. A., 4,706,263, Cl. 375-96.000.

Hughes, John L.; Irons, Frank E.; and Kwiatkowski, George, to Hughes Technology Pty Ltd. Hygienic attachments for therapy lasers. 4,705,036, Cl. 128-303.100.

Hughes, Simon H.C., to Kabushiki Kaisha Toshiba. Method for correcting phase errors in magnetic resonance imaging data. 4,706,027, Cl. 324-309.000.

Hughes Technology Pty Ltd.: *See—*
Hughes, John L.; Irons, Frank E.; and Kwiatkowski, George, 4,705,036, Cl. 128-303.100.

Hull, Richard W.: *See—*
Ouyang, Kenneth W.; and Hull, Richard W., 4,706,045, Cl. 331-117.0FE.

Hummelen, Jan C.; Meijer, Egbert W.; and Wynberg, Hans, to Akzo N.V. Polycycloalkylidene-polycycloalkanes, epidioxy derivatives thereof and method of preparation. 4,705,847, Cl. 530-350.000.

Humpal, Harold H., to United States of America, Energy. Mirror mount. 4,705,369, Cl. 350-636.000.

Hunter, James R., to Pfizer Inc. Composite material for induction heating. 4,705,727, Cl. 428-653.000.

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Huntley, David A.: *See—*
Layman, Frederick P.; Huntley, David A.; Dick, Paul H.; Coad, George L.; Kuhlman, Michael J.; Vecta, Roger M.; and Hobson, Phillip M., 4,705,951, Cl. 250-442.100.

Hussamy, Samir, to Burlington Industries, Inc. Process for improving the flame-retardant properties of printed shaped articles from aramid fibers. 4,705,523, Cl. 8-490.000.

Hussamy, Samir, to Burlington Industries, Inc. Process for the printing of shaped articles derived from aramid fibers. 4,705,527, Cl. 8-558.000.

Hutchinson S.A.: *See—*
Forneris, Alexandre, 4,705,089, Cl. 152-400.000.

Hutchison, James M. S.: *See—*
Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., 4,706,025, Cl. 324-309.000.

Huthmacher, Klaus: *See—*
Giray, Guenes; Huthmacher, Klaus; Kleemann, Axel; and Lied, Thomas, 4,705,867, Cl. 549-39.000.

Hutting, Gerardus T. M.; and Smulders, Engelbertus J. J. M., to Stork PMT B.V. Decropping apparatus. 4,704,768, Cl. 17-11.000.

Hwang, Shih-Ming. Burglar alarm with a multi-phase circuit, fail-safe control circuit, automatic rearm circuit and two-step disarming circuit. 4,706,064, Cl. 340-63.000.

Hykes, Robert C.: *See—*
DeBoer, William M.; DeBoer, Stanley E., Jr.; and Hykes, Robert C., 4,705,269, Cl. 272-73.000.

Iai, Kenichiro, to Yoshida Kogyo K.K. Drawing device for use in a drafting machine and a drawing pencil used therewith. 4,704,797, Cl. 33-18.100.

ICI Americas Inc.: *See—*
Resch, James F., 4,705,793, Cl. 514-293.000.

Idaho Research Foundation, Inc.: *See—*
Sasser, R. Garth; and Hamilton, William C., 4,705,748, Cl. 435-7.000.

Ideas That Sell, Inc.: *See—*
Ament, Harold E.; and Kirschner, Frederick G., 4,705,273, Cl. 273-72.00R.

Identicator Corp.: *See—*
Hedgcoth, Virgil; and Arndt, Douglas C., 4,705,299, Cl. 283-68.000.

Igashira, Toshihiko: *See—*
Sakakibara, Yasuyuki; Abe, Seiko; Tomita, Masahiro; Yorita, Hiroshi; Tanaka, Takeshi; and Igashira, Toshihiko, 4,705,003, Cl. 123-449.000.

Iguchi, Takeshi: *See—*
Kamiya, Hiroshi; Iguchi, Takeshi; and Fukumi, Shigenobu, 4,705,206, Cl. 228-183.000.

Iida, Kazumasa: *See—*
Danno, Yoshiaki; Takahashi, Akira; and Iida, Kazumasa, 4,705,001, Cl. 123-417.000.

Iizima, Masaki: *See—*
Shibata, Takashi; Yamada, Nobuo; Mada, Yoshikazu; and Iizima, Masaki, 4,705,977, Cl. 310-235.000.

Iizuka, Nobuyuki; Hirose, Fumiyuki; Sato, Isao; and Ishibashi, Yoji, to Hitachi, Ltd. Gas turbine combustor. 4,704,869, Cl. 60-751.000.

Ikeda, Kenji: *See—*
Shiba, Tetsuo; Takahashi, Kazuhisa; Ikeda, Kenji; and Higuchi, Hideyo, 4,706,106, Cl. 357-78.000.

Ikeda, Masakiyo; Kojima, Seiji; Kikuchi, Hiroshi; and Kashiwayanagi, Yuzo, to Furukawa Electric Co., Ltd., The. Chemical vapor deposition method for the thin film of semiconductor. 4,705,700, Cl. 437-231.000.

Ikegaya, Yuji: *See—*
Kakubo, Yuji; Niimi, Koji; and Ikegaya, Yuji, 4,706,291, Cl. 381-63.000.

Ikemori, Keiji, to Canon Kabushiki Kaisha. Aberrational deterioration prevented zoom lens. 4,705,363, Cl. 350-427.000.

Ikeyama, Takeshi, to Aisin Seiki Kabushiki Kaisha. Human condition monitoring and security controlling apparatus on a road-vehicle. 4,706,072, Cl. 340-576.000.

Ikeyama, Toshiharu: *See*—
Morita, Tsuneharu; Ikeyama, Toshiharu; Iwaki, Osamu; and Katsuta, Hisao, 4,705,445, Cl. 414-280.000.
Illinois Tool Works Inc.: *See*—
Kobetsky, Robert G., 4,704,799, Cl. 33-179.50R.
Imada, Haruhiko: *See*—
Takenaka, Takaji; Watanabe, Hideki; and Imada, Haruhiko, 4,706,165, Cl. 361-403.000.
Imaike, Sekiji; Hata, Takeki; and Yamazaki, Norio, to Taiyo Sanso Co., Ltd. Method and apparatus for producing microfine frozen particles. 4,704,873, Cl. 62-64.000.
Imajo, Minoru; and Kawakita, Tsunehiro, to Nissan Motor Company, Limited. Oil degradation warning system. 4,706,193, Cl. 364-424.000.
Imamura, Minoru: *See*—
Kawase, Akira; and Imamura, Minoru, 4,704,897, Cl. 73-40.50R.
Imbert, Guy: *See*—
Kwiatkowski, Jean-Claude; and Imbert, Guy, 4,706,222, Cl. 365-230.000.
Imondi, Giuliano: *See*—
Vergara, Sossio; D'Arrigo, Sebastiano; and Imondi, Giuliano, 4,706,011, Cl. 323-274.000.
Imoto, Yuzo; Takei, Toshihiro; Hattori, Yoshiyuki; Uno, Haruhiko; Inagaki, Mitsuo; and Takeda, Kenji, to Nippondenso Co., Ltd.; and Nippon Soken, Inc. Brake control apparatus for vehicle. 4,705,323, Cl. 303-116.000.
Imperial Chemical Industries PLC: *See*—
Araya, Abraham; and Lowe, Barrie M., 4,705,674, Cl. 423-277.000.
Baxter, Anthony G. W.; Bostock, Stephen B.; and Greenwood, David, 4,705,528, Cl. 8-641.000.
Whittle, Alan J., 4,705,900, Cl. 568-637.000.
Imran, Mir, to Mirowski, Mieczslaw. Electrophysiology study system using implantable cardioverter/pacer. 4,705,043, Cl. 128-419.0PG.
INA Walzlager Schaeffler KG: *See*—
Spiess, Karl; Baberowski, Waldemar; and Glatter, Otto, 4,704,782, Cl. 29-434.000.
Inagaki, Mitsuo: *See*—
Imoto, Yuzo; Takei, Toshihiro; Hattori, Yoshiyuki; Uno, Haruhiko; Inagaki, Mitsuo; and Takeda, Kenji, 4,705,323, Cl. 303-116.000.
Ind Inventions and Development of Novelties AG: *See*—
Ackeret, Peter, 4,705,166, Cl. 206-309.000.
Industrial Technology Research Institute: *See*—
Kuo, Tai-Haur, 4,706,013, Cl. 323-316.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
Racchini, Loriano, 4,706,076, Cl. 340-726.000.
Ingersoll-Rand Company: *See*—
Hartshorn, Kevin, 4,705,068, Cl. 137-512.100.
Inoue, Jiro; and Kota, Masaharu, to Murata Manufacturing Co., Ltd. Ultrasonic transducer. 4,705,981, Cl. 310-324.000.
Inoue, Masayuki: *See*—
Yamanaka, Masaaki; Inoue, Masayuki; and Asazuma, Harumitsu, 4,705,719, Cl. 428-323.000.
Inoue, Takehisa: *See*—
Miwa, Kishio; Kihara, Makoto; Sakaya, Kazuyuki; and Inoue, Takehisa, 4,705,627, Cl. 210-264.000.
Inoue, Takeshi; and Nada, Takatoshi, to NEC Corporation. Underwater low-frequency ultrasonic wave transmitter. 4,706,230, Cl. 367-174.000.
Inoue, Yasuo; and Shinohara, Daizo, to Olympus Optical Co., Ltd. Photographing apparatus for microscope. 4,705,381, Cl. 354-411.000.
Inoue, Yutaka: *See*—
Tanioka, Hiroshi; Ogino, Yoshitaka; Inoue, Yutaka; Naito, Masataka; and Hayakawa, Kimiaki, 4,706,128, Cl. 358-286.000.
Institut Francais du Petrole: *See*—
Gadelle, Claude; and Petit, Herve , 4,705,431, Cl. 405-267.000.
Institut Gornogo Dela So An SSSR: *See*—
Kostylev, Alexandr D.; Danilov, Boris B.; Smolyanitsky, Boris N.; Boginsky, Vladimir P.; Kogan, David I.; Smirnov, Oleg V.; and Saveliev, Vyacheslav N., 4,705,119, Cl. 175-92.000.
Institution pour le Developpement de la Gazeification Souterraine: *See*—
Ledent, Pierre; and Sonntag, Claus, 4,705,109, Cl. 166-251.000.
Intera Corporation: *See*—
Dyer, Michael E., 4,705,831, Cl. 525-426.000.
International Business Machines Corporation: *See*—
Akai, Takayuki; and Yamaguchi, Junichi, 4,706,205, Cl. 364-518.000.
Bahrle, Dieter; Schwerdt, Friedrich; and Stehling, Jurgen H., 4,705,592, Cl. 156-630.000.
Beha, Johannes G.; Dreyfus, Russell W.; and Rubloff, Gary W., 4,706,018, Cl. 324-158.00R.
Carle, Jean-Francois; and Phillippot, Patrick, 4,705,591, Cl. 156-617.0SP.
Chellis, LeRoy N.; and Ellis, Theron L., 4,704,791, Cl. 29-852.000.
Cronch, Darell D.; Fisher, Richard T.; Graham, Patricia A.; and Passafiume, John E., 4,706,008, Cl. 318-696.000.
Jove, Stephen A.; and Klaassen, Klaas B., 4,706,138, Cl. 360-67.000.
Kummer, David A.; Saenz, Jesus A.; and Trynosky, Stephen W., 4,706,079, Cl. 340-799.000.
Lebizay, Gerald; Lien, Yeong-Chang L.; and Yu, Philip S., 4,706,150, Cl. 340-825.500.
Muhich, John S.; and Thornley, Joseph S., 4,706,074, Cl. 340-709.000.
Patel, Arvind M., 4,706,250, Cl. 371-39.000.
International Minerals & Chemical Corp.: *See*—
Yang, Ren-Der; Hamilton, Edwin J., Jr.; and Taber, Larry D., 4,705,848, Cl. 530-399.000.
International Paper Company: *See*—
Gordon, Robert L.; and Kalberer, Roderick W., 4,705,197, Cl. 206-604.000.
International Rectifier Corporation: *See*—
Lidow, Alexander; and Herman, Thomas, 4,705,759, Cl. 437-29.000.
Interpat Limited: *See*—
Sacks, Dieter; and Monch, Hans, 4,704,763, Cl. 15-262.000.
Interthal, Werner: *See*—
Ohlendorf, Dieter; Hoffmann, Heinz; Interthal, Werner; and Pintschovius, Ulrich, 4,705,860, Cl. 546-347.000.
inTEST Corporation: *See*—
Smith, Nathan R., 4,705,447, Cl. 414-590.000.
Inui, Tomoyuki, to Showa Shell Sekiyu Kabushiki Kaisha; and Inui, Tomoyuki. Production of liquid hydrocarbon from gas containing lower hydrocarbon. 4,705,907, Cl. 585-415.000.
Inuzuka, Shozin; and Yamashita, Shuji, to NGK Spark Plug Co., Ltd. Resonating knock sensor. 4,704,894, Cl. 73-35.000.
Ireland, Anthony J.: *See*—
Palm, Charles S.; Slayton, Danny L.; Lak, Khosrow; Sampson, Peter F.; Davis, David R.; Wheatley, Maurice S., Jr.; Chatham, Gregory A.; Jones, Wayne C.; Charles, Kirk W.; and Ireland, Anthony J., 4,705,385, Cl. 355-4.000.
Irie, Namio: *See*—
Fukunaga, Yukio; Shibahata, Yasuji; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,705,130, Cl. 180-140.000.
Shibahata, Yasuji; Fukunaga, Yukio; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,705,131, Cl. 180-140.000.
Irinatsu, Yuichi: *See*—
Tanaka, Yukitaka; Irinatsu, Yuichi; Noguchi, Aiko; and Kobayashi, Takashi, 4,705,692, Cl. 426-607.000.
Irons, Frank E.: *See*—
Hughes, John L.; Irons, Frank E.; and Kwiatkowski, George, 4,705,036, Cl. 128-303.100.
Irvine Sensors Corporation: *See*—
Go, Tiong C., 4,706,166, Cl. 361-403.000.
Isayama, Muneo; and Midorikawa, Shoichi, to Ise Kagaku Kogyo Kabushiki Kaisha. Quantitative continuous feeding method for iodine. 4,705,221, Cl. 241-27.000.
Ise Kagaku Kogyo Kabushiki Kaisha: *See*—
Isayama, Muneo; and Midorikawa, Shoichi, 4,705,221, Cl. 241-27.000.
Ishibashi, Yoji: *See*—
Iizuka, Nobuyuki; Hirose, Fumiyuki; Sato, Isao; and Ishibashi, Yoji, 4,704,869, Cl. 60-751.000.
Ishida Scales Manufacturing Company, Ltd.: *See*—
Naito, Kazufumi, 4,705,126, Cl. 177-50.000.
Yamada, Seiji; Konishi, Satoshi; Kono, Katsuaki; and Nishimura, Ryoji, 4,705,125, Cl. 177-25.000.
Ishii, Jun: *See*—
Kobayashi, Osamu; Akagawa, Masaki; Tanaka, Masanori; Ishii, Jun; and Yamagishi, Ryoji, 4,706,202, Cl. 364-479.000.
Ishikawa, Haruyuki: *See*—
Kishi, Hajimu; Sakakibara, Shinsuke; Ishikawa, Haruyuki; and Kanda, Yuuichi, 4,706,000, Cl. 318-568.000.
Ishikawa, Youhei: *See*—
Hattori, Jun; and Ishikawa, Youhei, 4,706,052, Cl. 333-219.000.
Ishimoto, Zenichi, to Nikko Co., Ltd. Movable toy automatically swingable between an up position and a down position. 4,705,487, Cl. 446-290.000.
Ishino, Toshihiro: *See*—
Hayashi, Atsushi; Kuwabara, Kiyoharu; Sakai, Kohzo; and Ishino, Toshihiro, 4,705,763, Cl. 501-103.000.
Isomura, Shigenori: *See*—
Muramatsu, Toshihiko; Isomura, Shigenori; and Harada, Takashi, 4,706,196, Cl. 364-431.050.
Isozaki, Yoshimasa: *See*—
Nagai, Yohei; and Isozaki, Yoshimasa, 4,704,931, Cl. 84-1.010.
Istituto Gentili S.p.A.: *See*—
Staibano, Giorgio, 4,705,651, Cl. 260-502.50C.
Itaba, Yasushi; Saito, Keichiro; Tabuchi, Jyoichi; and Yoshizawa, Masao, to Toa Nenryo Kogyo K.K. Differentially crosslinked and oriented polyethylene film. 4,705,714, Cl. 428-215.000.
Itabashi, Satoshi; Kawakami, Soichiro; Terada, Katsunori; Suzuki, Hideyuki; Furushima, Teruhiko; and Fukaya, Masaki, to Canon Kabushiki Kaisha. Method of producing photosensor. 4,705,598, Cl. 156-643.000.
Itagaki, Hidenobu: *See*—
Yoda, Kiyoshi; Itagaki, Hidenobu; and Fujimura, Satoshi, 4,706,028, Cl. 324-309.000.
Itagaki, Masato; Kikuchi, Katsuaki; Nakayama, Susumu; Haeda, Yoshio; and Kawakami, Takashi, to Hitachi, Ltd. Components feeding apparatus. 4,704,792, Cl. 29-741.000.
Ito, Akitoshi: *See*—
Kodama, Mikio; Ito, Akitoshi; Yano, Motoichi; Fujiwara, Takayoshi; and Umeyama, Satoshi, 4,705,827, Cl. 525-67.000.
Ito, Hiroshi; and Mizutani, Yoshiki, to Mitsubishi Denki Kabushiki Kaisha. Contour detecting filter device using PAL samples of composite video signals without separation of luminance signals therefrom. 4,706,113, Cl. 358-37.000.
Ito, Keiko; Ito, Michiyasu; Tsuji, Shoichi; and Suzuki, Hisatosi, to Mitsui Toatsu Chemicals, Inc. Process for producing porous films involving a stretching step and the resultant product. 4,705,812, Cl. 521-92.000.

Ito, Keiko; Ito, Michiyasu; Tsuji, Shoichi; Suzuki, Hisatosi; and Ito, Shoichi, to Mitsui Toatsu Chemicals, Inc. Process for producing porous films involving a stretching step and the resultant film. 4,705,813, Cl. 521-92.000.

Ito, Masazumi, to Minolta Camera Kabushiki Kaisha. Copying apparatus with a document feeder. 4,705,393, Cl. 355-14.0SH.

Ito, Michiyasu: *See*—
Ito, Keiko; Ito, Michiyasu; Tsuji, Shoichi; and Suzuki, Hisatosi, 4,705,812, Cl. 521-92.000.
Ito, Keiko; Ito, Michiyasu; Tsuji, Shoichi; Suzuki, Hisatosi; and Ito, Shoichi, 4,705,813, Cl. 521-92.000.

Ito, Motoya; Takahashi, Noriyoshi; Watanabe, Masatoshi; Abukawa, Toshimi; Seya, Takeshi; Kainuma, Hiroshi; and Syutoo, Toshiyuki, to Hitachi, Ltd.; and Hitachi Cable, Ltd. Method of manufacturing electromagnetic members. 4,704,789, Cl. 29-609.000.

Ito, Shoichi: *See*—
Ito, Keiko; Ito, Michiyasu; Tsuji, Shoichi; Suzuki, Hisatosi; and Ito, Shoichi, 4,705,813, Cl. 521-92.000.

Ito, Takeyasu; and Kuwajima, Teruaki, to Nippon Paint Co., Ltd. Anticorrosive metal surface treating composition. 4,705,821, Cl. 524-407.000.

Ito, Tatsuya: *See*—
Hiraga, Yuji; and Ito, Tatsuya, 4,705,383, Cl. 355-3.0DD.

Ito, Toshio; Fujio, Shunichi; and Taya, Takeyoshi, to Toyota Jidosha Kabushiki Kaisha. Manufacturing method for an integral type crankshaft bearing cap. 4,705,092, Cl. 164-34.000.

Ito, Yasuhiko; and Shinonaga, Hideyuki, to Kokusai Denshin Denwa Co., Ltd. Communications satellite repeater. 4,706,239, Cl. 370-57.000.

Itoh, Atsushi: *See*—
Mori, Shunji; Tajima, Shinobu; and Itoh, Atsushi, 4,705,451, Cl. 414-70.000.

Itzel, Hanshelmut; and Barth, Volker, to Celamerck GmbH & Co. KG. Mixing and spraying device. 4,705,191, Cl. 222-80.000.

Iuchi, Munenori, to Sumitomo Rubber Industries, Ltd. Heavy duty pneumatic radial tires. 4,705,091, Cl. 152-541.000.

Iura, Kazuo: *See*—
Yoshida, Kinji; and Iura, Kazuo, 4,704,855, Cl. 57-58.540.

Ivanov, Mikhail A.; Komkov, Jury A.; and Fomina, Vera V., to Vsesojuznoe Nauchno-Proizvodstvennoe Obiedinenie Tsellulozno-bumazhnoy Promyshlennosti. Process for preparing powder-like iron-sodium tartrate complex. 4,705,876, Cl. 556-149.000.

Iwahashi, Henry H.: *See*—
Herst, Douglas J.; and Iwahashi, Henry H., 4,706,170, Cl. 362-217.000.

Iwaki, Osamu: *See*—
Morita, Tsuneharu; Ikeyama, Toshiharu; Iwaki, Osamu; and Katsuta, Hisao, 4,705,445, Cl. 414-280.000.

Iwako, Akinobu, to Citizen Watch Co., Ltd. Control circuit of direct current servomotor for floppy disk drive. 4,706,005, Cl. 318-603.000.

Iwama, Katsuaki; Takahashi, Mutsuo; and Shibata, Haruo, to Matsushita Electronics Corporation. High color rendering fluorescent lamp. 4,705,986, Cl. 313-487.000.

Iwasaki, Yukio: *See*—
Ohta, Minoru; Miura, Kazuhiko; Onoda, Michitoshi; Iwasaki, Yukio; and Hattori, Tadashi, 4,705,713, Cl. 428-209.000.

Iwase, Seiichiro: *See*—
Yamazaki, Takao; and Iwase, Seiichiro, 4,706,211, Cl. 364-760.000.

Izumi, Shuji: *See*—
Mukai, Hiromu; Yamaki, Toshio; Fujino, Akihiko; Izumi, Shuji; Nakai, Masaaki; and Taniguchi, Nobuyuki, 4,705,382, Cl. 354-412.000.

Izzi, Gilberto, to Fabbrica Italiana Magneti Marelli S.p.A. Glow plug for diesel engines of motor vehicles. 4,705,607, Cl. 204-15.000.

J. I. Case Company: *See*—
Schaefer, David V.; and Honeyager, Richard J., 4,704,777, Cl. 29-148.300.

J. M. Voith GmbH: *See*—
Lindenthal, Hans, 4,705,490, Cl. 464-132.000.

J. Wagner GmbH: *See*—
Boll, Hans-Joachim, 4,705,995, Cl. 318-129.000.

Jackson, Douglas J.: *See*—
Harbolt, Bruce; Saake, James T.; and Jackson, Douglas J., 4,705,432, Cl. 406-60.000.

Jackson, Lauren: *See*—
Cashaw, Alan G.; Cole, Robert; Holmes, Rory; Whitaker, Herbert L., Jr.; and Jackson, Lauren, 4,705,712, Cl. 428-152.000.

Jackson, W. Shaun. Convertible wind load exercise device. 4,705,267, Cl. 272-134.000.

Jacob, Joseph: *See*—
Geho, W. Blair; Lau, John R.; and Jacob, Joseph, 4,705,804, Cl. 514-474.000.

Jacob Schlaepfer & Co., AG: *See*—
Lauchenauer, Alfred E., 4,705,584, Cl. 156-79.000.

Jacobs, Ralph R.: *See*—
Sheng, Shinan-Chur S.; Kaiser, Jeffrey; Jacobs, Ralph R.; and Petersen, Alan B., 4,706,256, Cl. 372-61.000.

Jacobsen, Finn, to Kamyr AB. Method for the treatment of pulp with liquid. 4,705,600, Cl. 162-19.000.

Jagenberg AG: *See*—
Bodewein, Jakob, 4,704,930, Cl. 83-24.000.

James, Thomas A.: *See*—
Sanderson, Robert A.; and Crosby, Gaius P., 4,704,970, Cl. 109-73.000.

James, Tracye V. Cake holder. 4,705,163, Cl. 206-45.320.

Jang, Marco. Measuring device for canned powdered product. 4,705,196, Cl. 222-439.000.

Jankkila, Martti J.: *See*—
Honkaniemi, Matti E.; Mustikka, Lauri A.; Jankkila, Martti J.; Hokkanen, Pentti O.; Heikkila , Risto M.; and Lilja, Launo L., 4,705,474, Cl. 432-14.000.

Janome Sewing Machine Co. Ltd.: *See*—
Hara, Kazumasa; Satano, Akiyoshi; and Koike, Mikio, 4,704,975, Cl. 112-238.000.

Jansco, Sandor: *See*—
Madi-Szabo, Laszlo ; Morvai, Margit; Horvath nee Feher, Eva; Jansco, Sandor; Tamasi, Piroska; Kovacs, Istvan; Kiss nee Loss, Ilona Maria; Bacsa, Gyorgy; Kubala nee Papp, Maria; and Bene nee Horvath, Magdolna, 4,705,779, Cl. 514-27.000.

Japan Tobacco, Inc.: *See*—
Miyazaki, Masaru; and Kohata, Toshihide, 4,705,225, Cl. 242-56.00R.

Jardin, Hans; and Dworschak, Karl, to Webasto-Werk W. Baier GmbH & Co. Wind deflector assembly for vehicles and installation unit equipped therewith. 4,705,316, Cl. 296-217.000.

Jautelat, Rudiger: *See*—
Plapp, Gunther; Zichner, Botho; Jautelat, Rudiger; Kohler. Rolf; Kratt, Alfred; and Muller, Hans-Martin, 4,705,007, Cl. 123-519.000.

Jefferson Development, Inc.: *See*—
Jefferson, Stuart T., 4,704,811, Cl. 37-80.00A.

Jefferson, Stuart T., to Jefferson Development, Inc. Trenching attachment for a backhoe. 4,704,811, Cl. 37-80.00A.

Jenkins, Stephen R.: *See*—
Bomba, Frank C.; and Jenkins, Stephen R., 4,706,190, Cl. 364-200.000.

Jennings, Hamlin: *See*—
Grimes, John W., II; Jennings, Hamlin; and Brown, Paul W., 4,705,949, Cl. 250-440.100.

Jensen, Jorgen S., to Band & Olufsen A/S. Level indicating methods and means. 4,706,289, Cl. 381-56.000.

Jensen, Roger A.; and Wolfe, John M., to Jensen, Roger A. Screen printing assembly. 4,704,961, Cl. 101-114.000.

Jiang, Yuming: *See*—
Su, Yuanfu; and Jiang, Yuming, 4,705,894, Cl. 562-580.000.

Jinguji, Takumi, to Pioneer Electronic Corporation. Playback unit for still pictures with sound. 4,706,134, Cl. 358-343.000.

Jinsheng, Tang. Integral car body made of composite material. 4,705,716, Cl. 428-251.000.

Joco, Fidel M., to Garrett Corporation, The. Compressor wheel assembly for turbochargers. 4,705,463, Cl. 417-407.000.

Jodelet, Francois: *See*—
Longeray, Remi; Lanteri, Pierre; Mathia, Thomas; Jodelet, Francois; and Segura, Serge, 4,705,815, Cl. 521-160.000.

Jogand, Patrick: *See*—
Cransac, Jean-Pierre; Jogand, Patrick; and Sauvage, Michel, 4,705,661, Cl. 376-206.000.

John, Erwin R. Intraoperative monitoring or EP evaluation system utilizing an automatic adaptive self-optimizing digital comb filter. 4,705,049, Cl. 128-731.000.

Johns Hopkins University, The: *See*—
Snelling, William E.; and Penn, John E., 4,706,210, Cl. 364-758.000.

Johnson, Allan S., to Tapmatic Corporation. Reversible dual speed tapping attachment. 4,705,437, Cl. 408-139.000.

Johnson, Carl S. Apparatus for custom tinting soft contact lenses by dispenser of lenses. 4,705,370, Cl. 351-162.000.

Johnson Electric Industrial Manufactory Limited: *See*—
Baines, Roger F., 4,705,972, Cl. 310-71.000.

Johnson, Glyn: *See*—
Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., 4,706,025, Cl. 324-309.000.

Johnson, Jeffrey C.; Rothon, Stephen; and Slater, Andrew J., to Hayden Schweitzer Corp. Method and apparatus for applying paint. 4,704,952, Cl. 98-115.200.

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Perten, Herbert; and Ambrose, William, 4,706,131, Cl. 358-302.000.

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Johnson, Walter A.: *See*—
Kemp, Preston B., Jr.; Johnson, Walter A.; and Steigelman, James Q., 4,705,560, Cl. 75-0.50B.

Johnston, Stephen: *See*—
Poirier, Clovis; Banville, Marcel; McDonald, Mario; McDonald, Sabin; Johnston, Stephen; and Masson, Jean-Rene, 4,704,815, Cl. 43-4.000.

Jokl, Bernhard: *See*—
Abthoff, Joerg; Schuster, Hans-Dieter; Loose, Gunter; and Jokl, Bernhard, 4,704,863, Cl. 60-311.000.

Jones, Edward J., to United States of America, Air Force. Thermally controlled T/R module test apparatus. 4,704,872, Cl. 62-3.000.

Jones, Wayne C.: *See*—
Palm, Charles S.; Slayton, Danny L.; Lak, Khosrow; Sampson, Peter F.; Davis, David R.; Wheatley, Maurice S., Jr.; Chatham, Gregory A.; Jones, Wayne C.; Charles, Kirk W.; and Ireland, Anthony J., 4,705,385, Cl. 355-4.000.

Jopson, Harriet: *See—*
Lee, Kang I.; and Jopson, Harriet, 4,705,645, Cl. 252-500.000.
Jordan, Lamar. Hook strip for removable wall panels. 4,704,835, Cl. 52-486.000.
Jordi, Urs M., to Altop S.A. Watch mounted on a clip. 4,705,408, Cl. 368-278.000.
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Josephson, Elliot. DC-AC inverter with overload driving capability. 4,706,177, Cl. 363-24.000.
Jove, Stephen A.; and Klaassen, Klaas B., to International Business Machines Corporation. Amplification of signals produced by a magnetic sensor. 4,706,138, Cl. 360-67.000.
Judge, Joseph. Toothbrush holder attachment for toothpaste tubes. 4,705,194, Cl. 222-192.000.
Judy's Walking Beam Service, Inc.: *See—*
Moffett, Darcel R., 4,704,780, Cl. 29-252.000.
Julius Blum Gesellschaft m.b.H.: *See—*
Rock, Erich; and Hollenstein, Helmut, 4,705,328, Cl. 312-330.00R.
Jung, Johann: *See—*
Buschmann, Ernst; Himmele, Walter; Eckhardt, Heinz; Ernst, Hansgeorg; Rademacher, Wilhelm; and Jung, Johann, 4,705,553, Cl. 71-76.000.
Junge, Brent A.: *See—*
Thompson, James B.; and Junge, Brent A., 4,704,874, Cl. 62-187.000.
Just, Christoph; Plath, Dieter; and Walz, Gerd, to Hoechst AG. Polymerizable carbamoyloxyalkyldicarboxylic acid esters carrying hydroxyl groups, a process for their preparation and their use. 4,705,885, Cl. 560-158.000.
Juzswik, David L., to United Technologies Automotive, Inc. Bidirectional motor drive circuit. 4,705,997, Cl. 318-341.000.
Juzswik, David L.: *See—*
Webb, Nathaniel; and Juzswik, David L., 4,706,194, Cl. 364-424.000.
Kabushiki Kaisha Koden Seisakusho: *See—*
Hashiguchi, Shinji; Kimata, Hisayuki; and Koga, Yukuo, 4,706,090, Cl. 342-41.000.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Egawa, Akira; and Noudomi, Ryoichi, 4,706,252, Cl. 372-38.000.
Suketomo, Toshitaka; and Nezuka, Kenjiro, 4,704,922, Cl. 74-733.000.
Kabushiki Kaisha Sato: *See—*
Ono, Tsutomu; and Kashiwaba, Tadao, 4,706,095, Cl. 346-76.0PH.
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Kabushiki Kaisha Toshiba: *See—*
Bandai, Yoshiaki, 4,706,213, Cl. 364-900.000.
Hattori, Toshiaki; and Shimanuki, Machio, 4,706,142, Cl. 360-105.000.
Hughes, Simon H.C., 4,706,027, Cl. 324-309.000.
Nakagawa, Kaoru; Ogura, Mitsugi; Natori, Kenji; and Masuoka, Fujio, 4,706,249, Cl. 371-38.000.
Nakamura, Masaru; Okajima, Masaki; Komatsubara, Tadashi; Sadamasa, Tetsuo; and Nitta, Koichi, 4,706,101, Cl. 357-17.000.
Onodera, Toshihiro, 4,706,268, Cl. 378-99.000.
Shimizu, Hiroshi; and Kaizuka, Masao, 4,706,217, Cl. 365-154.000.
Takada, Kousuke; and Kousaka, Akira, 4,705,989, Cl. 315-39.510.
Watanabe, Junji, 4,705,394, Cl. 355-3.0DD.
Yamada, Hisashi; and Ohgoshi, Seiichi, 4,705,941, Cl. 250-201.000.
Kabushiki Kaisha Yaskawa Denki Seisakusho: *See—*
Nagasaka, Nagahiko, 4,705,971, Cl. 310-12.000.
Nagasaka, Nagahiko, 4,706,007, Cl. 318-687.000.
Kaempf, Ulrich: *See—*
Tullis, Barclay J.; Bailey, John S.; Gunawardena, D. R.; and Kaempf, Ulrich, 4,705,444, Cl. 414-226.000.
Kaffka, Karoly; Lezak, Tibor; Striker, Gyorgy; and Zeisel, Eva. Fountain mainly for indoor use. 4,705,216, Cl. 239-18.000.
Kaganowicz, Grzegorz; Enstrom, Ronald E.; and Robinson, John W., to RCA Corporation. Preparation of a surface for deposition of a passinating layer. 4,705,760, Cl. 437-234.000.
Kago, Yoshiyuki: *See—*
Yoshino, Yasuhisa; Kago, Yoshiyuki; Sakakibara, Hiroyuki; and Shinoda, Yoshio, 4,706,195, Cl. 364-426.000.
Kahelin, Edward W. Variable speed single-wheeled ball propelling machine. 4,705,014, Cl. 124-1.000.
Kainuma, Hiroshi: *See—*
Ito, Motoya; Takahashi, Noriyoshi; Watanabe, Masatoshi; Abukawa, Toshimi; Seya, Takeshi; Kainuma, Hiroshi; and Syutoo, Toshiyuki, 4,704,789, Cl. 29-609.000.
Kaiser, Jeffrey: *See—*
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Kaizuka, Masao: *See—*
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Kakubo, Yuji; Niimi, Koji; and Ikegaya, Yuji, to Nippon Gakki Seizo Kabushiki Kaisha. Reverberation imparting device. 4,706,291, Cl. 381-63.000.
Kalash, Kenneth E.: *See—*
Barclay, John A.; Stewart, Walter F.; Henke, Michael D.; and Kalash, Kenneth E., 4,704,871, Cl. 62-3.000.
Kalberer, Roderick W.: *See—*
Gordon, Robert L.; and Kalberer, Roderick W., 4,705,197, Cl. 206-604.000.
Kaltenbach, Karl W.; Rettew, Stephen; Rudy, John O.; and Szakacs, Gabor L., to Medica Corporation. Electrolyte analyzer. 4,705,668, Cl. 422-82.000.
Kamatics Corporation: *See—*
Orkin, Stanley S.; and Carlson, Craig L., 4,704,918, Cl. 74-579.00R.
Kamaya, Masashi, to Piaa Corporation. Reinforced roof carrier structure for a vehicular automobile. 4,705,198, Cl. 224-329.000.
Kamensky, Albert: *See—*
Gates, Louis E., Jr.; Kamensky, Albert; and Devendorf, Don C., 4,705,917, Cl. 174-52.0FP.
Kamil, Zvi, to Aerotel Ltd. Telephone system. 4,706,275, Cl. 379-144.000.
Kamio, Kunimara: *See—*
Saito, Yasuhisa; Takagishi, Hisao; Watanabe, Katsuya; Okuno, Kohichi; Kenmei, Junichi; and Kamio, Kunimara, 4,705,833, Cl. 525-504.000.
Kamiya, Hiroshi; Iguchi, Takeshi; and Fukumi, Shigenobu, to Nippondenso Co., Ltd. Method for brazing a magnesium-containing aluminum alloy. 4,705,206, Cl. 228-183.000.
Kampe, Klaus-Dieter: *See—*
Granzer, Ernold; and Kampe, Klaus-Dieter, 4,705,792, Cl. 514-275.000.
Kamyr AB: *See—*
Jacobsen, Finn, 4,705,600, Cl. 162-19.000.
Kanada, Kenji: *See—*
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Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,705,730, Cl. 430-57.000.
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,705,731, Cl. 430-57.000.
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Kanamori, Osamu, to Mitsubishi Denki Kabushiki Kaisha. Balustrade of a passenger conveyor. 4,705,155, Cl. 198-335.000.
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Saotome, Kaoru; Sasaki, Hiroyuki; and Kanbara, Katsuhiro, 4,705,244, Cl. 248-68.100.
Kanda, Atsushi; Kitani, Kazuo; and Shirai, Kiichirou, to Fuji Electric Company, Ltd.; and Sumitomo Precision Products Co., Ltd. Boiling refrigerant-type cooling system. 4,705,102, Cl. 165-104.330.
Kanda Tekko Kabushiki Kaisha: *See—*
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Kanda, Yuuichi: *See—*
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Kanemitsu, Shinji: *See—*
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Kanno, Masahide: *See—*
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Kanotz, William M.: *See—*
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Kao Corporation: *See—*
Sotoya, Koshiro; Kubo, Makoto; and Okabe, Kazuhiko, 4,705,893, Cl. 562-564.000.
Tanaka, Yukitaka; Irinatsu, Yuichi; Noguchi, Aiko; and Kobayashi, Takashi, 4,705,692, Cl. 426-607.000.
Karadimas, Georges, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA). Stator vane having a movable trailing edge flap. 4,705,452, Cl. 415-115.000.
Karaki, Kouichi; and Uchino, Fumio, to Olympus Optical Co., Ltd. Apparatus for displaying ultrasonic image. 4,706,185, Cl. 367-110.000.
Karnavas, Alexander G.; and Estrin, Jorge A., to University of Minnesota, Regents of the. Apparatus and method for rapid infusion of circulatory supportive fluids. 4,705,508, Cl. 604-113.000.
Kasahara, Shuhei; and Hiroshima, Mochisuke, to Dainippon Screen Mfg. Co., Ltd. Originals patching device. 4,705,390, Cl. 355-52.000.
Kasai, Kazumi, to Yoshida Kogyo K.K. Snap-fit clasp fastener for bags. 4,704,772, Cl. 24-669.000.
Kashiwaba, Tadao: *See—*
Ono, Tsutomu; and Kashiwaba, Tadao, 4,706,095, Cl. 346-76.0PH.
Kashiwagi, Shigeru, to Victor Company of Japan, Ltd. Horizontal deflection circuit having a variable retrace period. 4,705,993, Cl. 315-408.000.

Kashiwayanagi, Yuzo: *See*—
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Kasprzak, Rolande: *See*—
Szydlo, Nicolas; Boulitrop, Francois; and Kasprzak, Rolande, 4,704,784, Cl. 437-41.000.

Kassai, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Interface circuit for programmed controller. 4,706,214, Cl. 364-900.000.

Kastle, George E.; Kastle, Jennie R.; Stinedurf, Constance V.; Wilson, James E.; and Wilson, Barbara M., to Swak, Inc. Gameboard swivel. 4,705,276, Cl. 273-309.000.

Kastle, Jennie R.: *See*—
Kastle, George E.; Kastle, Jennie R.; Stinedurf, Constance V.; Wilson, James E.; and Wilson, Barbara M., 4,705,276, Cl. 273-309.000.

Kasuya, Kazusato: *See*—
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Kato, Masayuki: *See*—
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Kato, Masuhiro: *See*—
Yamada, Hirotada; Masai, Naruhito; Ueda, Sinji; Okuda, Takao; Fukasawa, Masatomo; Kato, Masuhiro; and Fukumura, Masataka, 4,705,784, Cl. 514-202.000.

Kato, Shinichi; Sasaki, Masahiko; Kato, Tadashi; Kanno, Masahide; Takahashi, Yutaka; and Saito, Katsuyuki, to Olympus Optical Co., Ltd. Control circuit for video endoscope. 4,706,118, Cl. 358-98.000.

Kato, Tadashi: *See*—
Kato, Shinichi; Sasaki, Masahiko; Kato, Tadashi; Kanno, Masahide; Takahashi, Yutaka; and Saito, Katsuyuki, 4,706,118, Cl. 358-98.000.

Katsuta, Hisao: *See*—
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Kaufmann, Meinolph: *See*—
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Kawabata, Kohji: *See*—
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Kawagishi, Toshio: *See*—
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Kawai, Yoichi; Abe, Masaru; Yoshihara, Akio; Hayashi, Shigeru; and Sekiguchi, Katsumi, to Mitsui Toatsu Chemicals, Incorporated. Polypropylene-base resin composition. 4,705,818, Cl. 523-200.000.

Kawakami, James H.; Harris, James E.; Maresca, Louis M.; Robeson, Lloyd M.; and Cotter, Robert J., to Amoco Corporation. Ordered, alternating sulfone polycarbonate composition. 4,705,822, Cl. 524-425.000.

Kawakami, Soichiro: *See*—
Itabashi, Satoshi; Kawakami, Soichiro; Terada, Katsunori; Suzuki, Hideyuki; Furushima, Teruhiko; and Fukaya, Masaki, 4,705,598, Cl. 156-643.000.

Kawakami, Takashi: *See*—
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Kawakita, Tsunehiro: *See*—
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Kawamoto, Yoshimichi; Furukawa, Yoshimi; Hamada, Tetsuro; and Serizawa, Mitsuya, to Honda Giken Kogyo Kabushiki Kaisha. Front and rear wheel steering device. 4,705,135, Cl. 180-236.000.

Kawanabe, Tomohiko; Asakura, Masahiko; Kushida, Noritaka; Shiina, Takanori; and Muroya, Minoru, to Honda Giken Kogyo Kaibushiki Kaisha. Air intake side secondary air supply system for an internal combustion engine with a duty ratio control operation. 4,705,012, Cl. 123-589.000.

Kawase, Akira; and Imamura, Minoru, to Tokyo Gas Co. Limited. Locating method of and the locating unit for leaks on piping. 4,704,897, Cl. 73-40.50R.

Kawata, Ken: *See*—
Hirai, Hiroyuki; Sato, Kozo; Yabuki, Yoshiharu; and Kawata, Ken, 4,705,737, Cl. 430-203.000.

Kay, Carl J., to Products Research & Chemical Corporation. Thermal barrier extrusion. 4,704,839, Cl. 52-732.000.

Kay, Peter D.; and Girot, Michael C., to Tioxide Group PLC. Compositions incorporating titanium compounds. 4,705,568, Cl. 106-26.000.

Kaya, Azmi; and Rice, Larry, to Babcock & Wilcox Company, The. Supervisory control system for continuous drying. 4,704,805, Cl. 34-31.000.

Kazuo, Nakahama: *See*—
Masakazu, Kikuchi; and Kazuo, Nakahama, 4,705,750, Cl. 435-68.000.

Keller, Arnold, to Waldemar Link GmbH & Co. Anchoring rod for tubular bones. 4,705,032, Cl. 128-92.0YZ.

Keller, Heinz; Brocker, Heinz; and Lehner, Martin, to Ferd Rueesch AG. Process for making screen printing fabrics for screen printing cylinders. 4,705,608, Cl. 204-28.000.

Kellstrom, Magnus, to Aktiebolaget SKF. Radial rolling bearing. 4,705,411, Cl. 384-450.000.

Kelly, Michael D.; and Kramer, Daniel P., to United States of America, Energy. Production of glass or glass-ceramic to metal seals with the application of pressure. 4,705,585, Cl. 156-89.000.

Kelly, Robert R., to Borg-Warner Corporation. Pressure-biased, temperature sensor. 4,706,063, Cl. 340-60.000.

Kemp, Melvin T. Snap together window well. 4,704,828, Cl. 52-107.000.

Kemp, Preston B., Jr.; Johnson, Walter A.; and Steigelman, James Q., to GTE Products Corporation. Process for producing metallic powders. 4,705,560, Cl. 75-0.50B.

Kendall Company, The: *See*—
DeCoste, Leonard D., Jr.; and Mamish, Abboud L., 4,705,715, Cl. 428-246.000.
Patel, Bhupendra C., 4,705,502, Cl. 604-49.000.
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Kenmei, Junichi: *See*—
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Kenner Parker Toys Inc.: *See*—
Bohl, Walter L., Jr.; and Belfor, Michael E., 4,705,488, Cl. 446-393.000.

Kenney, Alan: *See*—
South, Alan; and Kenney, Alan, 4,704,761, Cl. 15-250.190.

Kerkman, Russel J.; and Rowan, Timothy M., to Allen-Bradley Company, Inc. Frequency compensated regulator. 4,706,012, Cl. 323-280.000.

Kern, Otto; Wilhelm, Franz; and Salamon, Ernst, to Boehringer Ingelheim Vetmedica GmbH. Method of improving resorption of injected antibacterially active substances or combinations. 4,705,803, Cl. 514-450.000.

Kerndt, Rickie S.: *See*—
Recktenwald, Diether J.; Kerndt, Rickie S.; Loken, Michael R.; and Chen, Chia H., 4,704,891, Cl. 73-1.00R.

Kerner, Aron: *See*—
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Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
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Kernforschungszentrum Karlsruhe GmbH: *See*—
Becker, Erwin; Ehrfeld, Wolfgang; and Hagmann, Peter, 4,705,605, Cl. 204-11.000.
Knochel, Arndt; Doscher, Burghard; and Podesta, Wolfgang, 4,705,635, Cl. 210-633.000.
Ondracek, Gerhard, 4,705,577, Cl. 148-11.50P.

Kerres, Siegfried M. Apparatus for operating a smoking chamber. 4,704,957, Cl. 99-451.000.

Kershaw Manufacturing Company, Inc.: *See*—
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Kersten, Reinhard: *See*—
Ganser, Hans G.; Kersten, Reinhard; Schafer, Rolf; and Stormberg, Hans P., 4,705,991, Cl. 315-209.00R.

Kertzman, Jack, to Perma Pure Products, Inc. Fluid drying tube. 4,705,543, Cl. 55-158.000.

Kervagoret, Gilbert, to Societe Anonyme D.B.A. Brake-pressure control and modulation system for an antilocking brake circuit assembly component for a disc brake. 4,705,324, Cl. 303-119.000.

Kessler, Richard V.: *See*—
Najjar, Mitri S.; and Kessler, Richard V., 4,705,538, Cl. 48-197.00R.

Kettschau, Hans-Jurgen, to U.S. Philips Corporation. Clocked direct voltage converter. 4,706,176, Cl. 363-21.000.

Kewpie Kabushiki Kaisha: *See*—
Hasegawa, Mineo; and Ozaki, Kitao, 4,705,755, Cl. 435-316.000.

Kiedaisch, Randall A., to Manville Corporation. Article display carton. 4,705,208, Cl. 229-120.080.

Kieler, David R. Beverage cooler. 4,704,875, Cl. 62-372.000.

Kihara, Makoto: *See*—
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Kiji, Jitsuo: *See*—
Okano, Tamon; Kumobayashi, Hidenori; Akutagawa, Susumu; Kiji, Jitsuo; Konishi, Hisatoshi; Fukuyama, Keiichi; and Shimano, Yasunobu, 4,705,895, Cl. 564-15.000.

Kikuchi, Eiji: *See*—
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Kikuchi, Hiroshi: *See*—
Ikeda, Masakiyo; Kojima, Seiji; Kikuchi, Hiroshi; and Kashiwayanagi, Yuzo, 4,705,700, Cl. 437-231.000.

Kikuchi, Katsuaki: *See*—
Itagaki, Masato; Kikuchi, Katsuaki; Nakayama, Susumu; Haeda, Yoshio; and Kawakami, Takashi, 4,704,792, Cl. 29-741.000.

Kikuchi, Tetsuro: *See*—
Hashikawa, Atsushi; Kitagawa, Nozomi; and Kikuchi, Tetsuro, 4,704,999, Cl. 123-299.000.

Kim, Il G. Dilator for Sphincter of Oddi. 4,705,041, Cl. 128-343.000.

Kimata, Hisayuki: *See*—
Hashiguchi, Shinji; Kimata, Hisayuki; and Koga, Yukuo, 4,706,090, Cl. 342-41.000.

Kimura, Hiroshi; and Abiko, Kenji, to Kimura, Hiroshi; Abiko, Kenji; Nihon Shinku Gijutsu Kabushiki Kaisha; and Olympus Optical Company Limited. High temperature microscope. 4,705,366, Cl. 350-529.000.

Kimura, Naofumi: *See*—
Hamada, Hiroshi; Nakazawa, Kiyoshi; Take, Hiroshi; Kimura, Naofumi; and Funada, Fumiaki, 4,706,173, Cl. 362-341.000.

Kimura, Shinichi, to Canon Kabushiki Kaisha. Apparatus for displaying the layout of text. 4,706,078, Cl. 340-735.000.

Kimura, Tsutomu; and Watanabe, Yukio, to Fuji Photo Film Co., Ltd. Radiation image recording and read-out apparatus with object data output capability. 4,705,953, Cl. 250-484.100.

King, Francis D.: *See*—
Hadley, Michael S.; and King, Francis D., 4,705,858, Cl. 546-112.000.
Kinoshita, Roy Y.; McCollum, Patrick E.; and Colan, Mark E., to Rockwell International Corporation. Solid state dc rate of rise controlled switch. 4,705,962, Cl. 307-247.100.
Kinouchi, Takashige: *See*—
Miyata, Shinobu; and Kinouchi, Takashige, 4,706,219, Cl. 365-189.000.
Kintek, Inc.: *See*—
Blackmer, David E.; and Townsend, James H., Jr., 4,706,287, Cl. 351-17.000.
Kirchmayer, Gerald: *See*—
Marsoner, Hermann; Kirchmayer, Gerald; and List, Helmut, 4,704,893, Cl. 73-1.00G.
Kirigaya, Tadayuki; and Taguchi, Ichiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Pair of light shielding film cases for surveillance camera. 4,705,375, Cl. 354-275.000.
Kirkland, Joseph J.: *See*—
Glajch, Joseph L.; and Kirkland, Joseph J., 4,705,725, Cl. 428-405.000.
Kirkland, Wyatt S. Spin-blast tool. 4,704,826, Cl. 51-411.000.
Kirschner, Frederick G.: *See*—
Ament, Harold E.; and Kirschner, Frederick G., 4,705,273, Cl. 273-72.00R.
Kirschner, Wallace; Nambudiri, Easwaran C. N.; and Patterson, Douglas H., to Pitney Bowes Inc. Data protection system for electronic postage meters having multiple non-volatile multiple memories. 4,706,215, Cl. 364-900.000.
Kisanuki, Hisayuki, to Toyoda Gosei Co., Ltd. Door glass run for automobiles. 4,704,820, Cl. 49-441.000.
Kish, Hajimu; Seki, Masaki; Takegahara, Takashi; and Onishi, Yasushi, to Fanuc Ltd. Area cutting method. 4,706,201, Cl. 364-474.000.
Kishi, Hajimu; Sakakibara, Shinsuke; Ishikawa, Haruyuki; and Kanda, Yuuichi, to Fanuc Ltd. Tool posture control system. 4,706,000, Cl. 318-568.000.
Kishi, Hajimu; Seki, Masaki; and Takegahara, Takashi, to Fanuc Ltd. Area cutting method. 4,706,200, Cl. 364-474.000.
Kishimoto, Mikio: *See*—
Kitahata, Shinichi; and Kishimoto, Mikio, 4,705,718, Cl. 428-323.000.
Kishner, Stanley J.: *See*—
Benoit, Albert J.; Boden, Dudley M.; Decker, David G.; Kishner, Stanley J.; and Van Arsdell, Robert D., 4,706,206, Cl. 364-526.000.
Kiss nee Loss, Ilona Maria: *See*—
Madi-Szabo, Laszlo ; Morvai, Margit; Horvath nee Feher, Eva; Jansco, Sandor; Tamasi, Piroska; Kovacs, Istvan; Kiss nee Loss, Ilona Maria; Bacsa, Gyorgy; Kubala nee Papp, Maria; and Bene nee Horvath, Magdolna, 4,705,779, Cl. 514-27.000.
Kitade, Nobumitsu, to Fuji Jukogyo Kabushiki Kaisha. System for controlling a transfer clutch of a four-wheel drive vehicle. 4,705,134, Cl. 180-233.000.
Kitagawa, Nozomi: *See*—
Hashikawa, Atsushi; Kitagawa, Nozomi; and Kikuchi, Tetsuro, 4,704,999, Cl. 123-299.000.
Kitahata, Shinichi; and Kishimoto, Mikio, to Hitachi Maxell, Ltd. Magnetic recording medium. 4,705,718, Cl. 428-323.000.
Kitani, Kazuo: *See*—
Kanda, Atsushi; Kitani, Kazuo; and Shirai, Kiichirou, 4,705,102, Cl. 165-104.330.
Kitchin, Jonathan P.; Powers, Stephen R.; Penfound, Keith A.; Finn, Peter J.; and Fisher, Michael G., to Minnesota Mining and Manufacturing Company. Photographic materials and color proofing system. 4,705,745, Cl. 430-505.000.
Kiwi Brands, Inc.: *See*—
Burke, Peter A.; Duering, Walter; and Gut, Martin, 4,705,181, Cl. 215-220.000.
Kiyono, Yasuhiro; and Takeyama, Yutaka, to Omron Tateisi Electronics Co. Switch control device for motor vehicle. 4,705,959, Cl. 307-9.000.
Kizawa, Hiroyuki, to Seikosha Co., Ltd. Clock. 4,706,238, Cl. 368-296.000.
Klaassen, Klaas B.: *See*—
Jove, Stephen A.; and Klaassen, Klaas B., 4,706,138, Cl. 360-67.000.
Klann, Paul A. Pipe organ valve. 4,704,937, Cl. 84-339.000.
Klaue, Kaj, to Synthes Ltd. (U.S.A.). Intramedullary nail. 4,705,027, Cl. 128-92.0YY.
Kleemann, Axel: *See*—
Giray, Guenes; Huthmacher, Klaus; Kleemann, Axel; and Lied, Thomas, 4,705,867, Cl. 549-39.000.
Klein, Peter: *See*—
Espenschied, Bernd; and Klein, Peter, 4,705,844, Cl. 528-275.000.
Kleinhappl, Erich: *See*—
Marsoner, Hermann; and Kleinhappl, Erich, 4,705,667, Cl. 422-68.000.
Kleinholz, Edward O. Fuel vaporizer. 4,705,008, Cl. 123-557.000.
Kleinman, Dennis P.: *See*—
Thornell, John S.; and Kleinman, Dennis P., 4,704,743, Cl. 2-159.000.
Kleisath, Stanley N. Electricians wire spool carrier. 4,705,283, Cl. 280-47.120.
Klempner, Daniel: *See*—
Frisch, Kurt C.; Klempner, Daniel; Radisch, Helmer; and Holzer, Gerhard, 4,705,721, Cl. 428-349.000.
Klimesch, Erich: *See*—
Kundinger, Ernst F.; Klimesch, Erich; Zengel, Hans-Georg; and Lasher, Jeffery D., 4,705,720, Cl. 428-332.000.
Klos, Klaus-Peter; Lindemann, Karl-Heinz; and Birnstiel, Willi, to Elektro-Brite GmbH. Acidic chromium containing coating solution for zinc or cadmium surfaces. 4,705,576, Cl. 148-6.200.
Klotzer, Sieghart; Mucke, Bruno; Mahlberg, Gunther; and Becker, Manfred, to Agfa Gevaert Aktiengesellschaft. Color photographic recording material containing a silver halide emulsion and a process for its production. 4,705,747, Cl. 430-550.000.
Knapp, Richard W. Rake for baseball and softball fields. 4,704,852, Cl. 56-400.140.
Knapton, Paul A. Reusable multi-compartment container with charging and discharging means. 4,705,192, Cl. 222-144.500.
Knifton, John F.: *See*—
McEntire, Edward E.; and Knifton, John F., 4,705,898, Cl. 564-467.000.
Knochel, Arndt; Doscher, Burghard; and Podesta, Wolfgang, to Kernforschungszentrum Karlsruhe GmbH. Process for enriching and separating oxides of heavy hydrogen isotopes from acid, aqueous solutions or other aqueous streams. 4,705,635, Cl. 210-633.000.
Knowd, Michael J., to Minnesota Mining and Manufacturing Company. Decoder for a recorder-decoder system. 4,706,282, Cl. 380-3.000.
Knowd, Michael J., to Minnesota Mining and Manufacturing Company. Circuitry for characterizing speech for tamper protected recording. 4,706,293, Cl. 381-31.000.
Kobayashi Bansokiki Co., Ltd.: *See*—
Morita, Tsuneharu; Ikeyama, Toshiharu; Iwaki, Osamu; and Katsuta, Hisao, 4,705,445, Cl. 414-280.000.
Kobayashi, Hideaki: *See*—
Arai, Yoshinao; Takahashi, Shino; Oikawa, Eigo; Sato, Shigeru; and Kobayashi, Hideaki, 4,706,187, Cl. 364-191.000.
Kobayashi, Kazuhiro; Koboshi, Shigeharu; Kuse, Satoru; Miyaoka, Kazuyoshi; and Kurematsu, Masayuki, to Konishiroku Photo Industry Co., Ltd. Automatic processing machine for light-sensitive color photographic material. 4,705,377, Cl. 354-322.000.
Kobayashi, Kazuhiro; Koboshi, Shigeharu; Kuse, Satoru; Miyaoka, Kazuyoshi; Kurematsu, Masayuki; and Uchida, Makoto, to Konishiroku Photo Ind. Co., Ltd. Automatic processing machine for photography. 4,705,379, Cl. 354-324.000.
Kobayashi, Kazuhiro: *See*—
Miyaoka, Kazuyoshi; Kobayashi, Kazuhiro; Kuse, Satoru; Kurematsu, Masayuki; and Koboshi, Shigeharu, 4,705,378, Cl. 354-324.000.
Kobayashi, Osamu; Akagawa, Masaki; Tanaka, Masanori; Ishii, Jun; and Yamagishi, Ryoji, to Nippon Coinco Co., Ltd. Control system of a vending machine. 4,706,202, Cl. 364-479.000.
Kobayashi, Takashi: *See*—
Tanaka, Yukitaka; Irinatsu, Yuichi; Noguchi, Aiko; and Kobayashi, Takashi, 4,705,692, Cl. 426-607.000.
Kobayashi, Takehiro: *See*—
Maruyama, Kenji; and Kobayashi, Takehiro, 4,705,228, Cl. 242-84.20G.
Kobayashi, Waichi, to Ube Industries, Ltd. Hydraulic material composition. 4,705,569, Cl. 106-85.000.
Kobetsky, Robert G., to Illinois Tool Works Inc. Master gear error compensation. 4,704,799, Cl. 33-179.50R.
Koboshi, Shigeharu: *See*—
Kobayashi, Kazuhiro; Koboshi, Shigeharu; Kuse, Satoru; Miyaoka, Kazuyoshi; and Kurematsu, Masayuki, 4,705,377, Cl. 354-322.000.
Kobayashi, Kazuhiro; Koboshi, Shigeharu; Kuse, Satoru; Miyaoka, Kazuyoshi; Kurematsu, Masayuki; and Uchida, Makoto, 4,705,379, Cl. 354-324.000.
Miyaoka, Kazuyoshi; Kobayashi, Kazuhiro; Kuse, Satoru; Kurematsu, Masayuki; and Koboshi, Shigeharu, 4,705,378, Cl. 354-324.000.
Kocak, Nuri, to Bipore, Inc. Introducer sheath assembly. 4,705,511, Cl. 604-282.000.
Koch, Frank J., to DeFelsko Corporation. Coin acceptor for vending machine. 4,705,153, Cl. 194-277.000.
Koch, Rudiger, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Process and arrangement for separating ceramic nuclear fuels from metallic casing or support members. 4,705,575, Cl. 134-24.000.
Kockelmans, Henricus G. J. M.: *See*—
Huntjens, Joseph M. J. E.; Kockelmans, Henricus G. J. M.; and Pleyers, Jozef J. A., 4,705,388, Cl. 355-15.000.
Kodama, Mikio; Ito, Akitoshi; Yano, Motoichi; Fujiwara, Takayoshi; and Umeyama, Satoshi, to Sumitomo Naugatuck Co., Ltd. Resin composition comprising unsaturated dicarboxylic acid anhydride polymer, polycarbonate resin and modified olefin polymer. 4,705,827, Cl. 525-67.000.
Koehler, Howard A.: *See*—
Hamstra, James R.; Koehler, Howard A.; Rusterholz, John T.; and Tanglin, David J., 4,706,191, Cl. 364-200.000.
Koga, Kiyoshi: *See*—
Matsuura, Kazuo; Yoshioka, Hiroshi; and Koga, Kiyoshi, 4,705,263, Cl. 267-33.000.
Koga, Yukuo: *See*—
Hashiguchi, Shinji; Kimata, Hisayuki; and Koga, Yukuo, 4,706,090, Cl. 342-41.000.
Kogan, David I.: *See*—
Kostylev, Alexandr D.; Danilov, Boris B.; Smolyanitsky, Boris N.; Boginsky, Vladimir P.; Kogan, David I.; Smirnov, Oleg V.; and Saveliev, Vyacheslav N., 4,705,119, Cl. 175-92.000.

Koger, T. Bruce: *See*—
Bernstein, Jonathan J.; Koger, T. Bruce; and Chanley, Charles S., 4,705,659, Cl. 264-29.600.
Kohata, Toshihide: *See*—
Miyazaki, Masaru; and Kohata, Toshihide, 4,705,225, Cl. 242-56.00R.
Kohler, Rolf: *See*—
Plapp, Gunther; Zichner, Botho; Jautelat, Rudiger; Kohler, Rolf; Kratt, Alfred; and Muller, Hans-Martin, 4,705,007, Cl. 123-519.000.
Kohno, Michio, to Canon Kabushiki Kaisha. Focus detection in a projection optical system. 4,705,940, Cl. 250-201.000.
Koike, Eishi, to Ozen Corporation. Electric equipment driving circuit. 4,705,994, Cl. 318-16.000.
Koike, Mikio: *See*—
Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, 4,704,975, Cl. 112-238.000.
Koitabash, Takatoshi, to Sanden Corporation. Electromagnetic clutch with spiral plated surfaces to improve frictional contact. 4,705,973, Cl. 310-78.000.
Kojima, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Signal discriminating apparatus for extracting component signals from a composite signal. 4,706,034, Cl. 328-151.000.
Kojima, Nobutoshi, to Tokai Television Broadcasting Company Limited. Video recording apparatus with editing and mixing of delayed monitored video signal using equidistant record, read and erase heads. 4,706,135, Cl. 360-14.100.
Kojima, Seiji: *See*—
Ikeda, Masakiyo; Kojima, Seiji; Kikuchi, Hiroshi; and Kashiwayanagi, Yuzo, 4,705,700, Cl. 437-231.000.
Kojima, Takio; and Taniguchi, Masato, to NGK Spark Plug Co., Ltd. Mounting structure for ceramic sub-combustion chambers. 4,704,998, Cl. 123-271.000.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Ito, Yasuhiko; and Shinonaga, Hideyuki, 4,706,239, Cl. 370-57.000.
Kolb, Gerald C.; and Reguiski, Thomas W., to Dow Chemical Company, The. Cyclic acetal-alcohols. 4,705,872, Cl. 549-448.000.
Kolbus GmbH & Co. KG: *See*—
Horst, Rathert, 4,704,973, Cl. 112-21.000.
Kolditz, Helmut: *See*—
Ebeling, Wolfgang; and Kolditz, Helmut, 4,705,120, Cl. 175-99.000.
Kolley, Arnold: *See*—
Bruns, Helmut; Freiheit, Artur; and Kolley, Arnold, 4,705,546, Cl. 55-182.000.
Kollmorgen Technologies Corporation: *See*—
Benoit, Albert J.; Boden, Dudley M.; Decker, David G.; Kishner, Stanley J.; and Van Arsdell, Robert D., 4,706,206, Cl. 364-526.000.
Kolts, John H.; and Delzer, Gary A., to Phillips Petroleum Company. Composition of matter for conversion of C_3 and C_4 hydrocarbons. 4,705,769, Cl. 502-241.000.
Kolts, John H.; and Delzer, Gary A., to Phillips Petroleum Company. Composition of matter and method for conversion of C3 and C4 hydrocarbons. 4,705,772, Cl. 502-303.000.
Komatsu, Isamu; and Serizawa, Kenkichi, to Aida Engineering, Ltd. Playback system grinding robot. 4,706,004, Cl. 318-568.000.
Komatsubara, Tadashi: *See*—
Nakamura, Masaru; Okajima, Masaki; Komatsubara, Tadashi; Sadamasa, Tetsuo; and Nitta, Koichi, 4,706,101, Cl. 357-17.000.
Komiyama, Choji; and Oishi, Kengo, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 4,706,148, Cl. 360-132.000.
Komkov, Jury A.: *See*—
Ivanov, Mikhail A.; Komkov, Jury A.; and Fomina, Vera V., 4,705,876, Cl. 556-149.000.
Komorowski, Robert B.; and Else, Mark, to Plessey Overseas Limited. Simulation of aerial decoy arrangements. 4,705,477, Cl. 434-24.000.
Kondo, Mitsuru, to Ricoh Company. Ltd. Facsimile apparatus. 4,706,126, Cl. 358-257.000.
Kone Instruments Inc.: *See*—
Deluhery, James G.; and Truitt, Peter G., 4,705,044, Cl. 128-419.00D.
Konishi, Hisatoshi: *See*—
Okano, Tamon; Kumobayashi, Hidenori; Akutagawa, Susumu; Kiji, Jitsuo; Konishi, Hisatoshi; Fukuyama, Keiichi; and Shimano, Yasunobu, 4,705,895, Cl. 564-15.000.
Konishi, Satoshi: *See*—
Yamada, Seiji; Konishi, Satoshi; Kono, Katsuaki; and Nishimura, Ryoji, 4,705,125, Cl. 177-25.000.
Konishiroku Photo Ind. Co., Ltd.: *See*—
Kobayashi, Kazuhiro; Koboshi, Shigeharu; Kuse, Satoru; Miyaoka, Kazuyoshi; Kurematsu, Masayuki; and Uchida, Makoto, 4,705,379, Cl. 354-324.000.
Maekawa, Yoshikazu; and Okui, Susumu, 4,705,389, Cl. 355-26.000.
Miyaoka, Kazuyoshi; Kobayashi, Kazuhiro; Kuse, Satoru; Kurematsu, Masayuki; and Koboshi, Shigeharu, 4,705,378, Cl. 354-324.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Hirota, Fumiyuki; Miwa, Tadashi; and Yamada, Yasushi, 4,705,265, Cl. 271-122.000.
Kobayashi, Kazuhiro; Koboshi, Shigeharu; Kuse, Satoru; Miyaoka, Kazuyoshi; and Kurematsu, Masayuki, 4,705,377, Cl. 354-322.000.
Kono, Katsuaki: *See*—
Yamada, Seiji; Konishi, Satoshi; Kono, Katsuaki; and Nishimura, Ryoji, 4,705,125, Cl. 177-25.000.
Kopf, Rowland J., deceased (by Kopf, Virginia G., heiress); and Flynn, William C., to Uniset Corporation. Pivot-load powder actuated tool with firing chamber insert. 4,705,200, Cl. 227-9.000.
Kopf, Virginia G., heiress: *See*—
Kopf, Rowland J., deceased; and Flynn, William C., 4,705,200, Cl. 227-9.000.
Kopp, Teodora T.: *See*—
Cesa, Mark C.; Rinz, James E.; and Kopp, Teodora T., 4,705,864, Cl. 548-309.000.
Koppers Company, Inc.: *See*—
Dressler, Hans, 4,705,879, Cl. 558-194.000.
Kossakowski, Edward J.: *See*—
Capobianco, Paul J.; Butwell, Kenneth F.; and Kossakowski, Edward J., 4,705,673, Cl. 423-229.000.
Kostylev, Alexandr D.; Danilov, Boris B.; Smolyanitsky, Boris N.; Boginsky, Vladimir P.; Kogan, David I.; Smirnov, Oleg V.; and Saveliev, Vyacheslav N., to Institut Gornogo Dela So An SSSR. Annular air-hammer apparatus for drilling holes. 4,705,119, Cl. 175-92.000.
Kosugi, Tetsuo, to Hitachi, Ltd. Ceramic structure having thermal shock resistance. 4,705,761, Cl. 501-87.000.
Kosugi, Yoshihiro: *See*—
Kumagai, Toru; and Kosugi, Yoshihiro, 4,706,108, Cl. 358-10.000.
Kota, Masaharu: *See*—
Inoue, Jiro; and Kota, Masaharu, 4,705,981, Cl. 310-324.000.
Kousaka, Akira: *See*—
Takada, Kousuke; and Kousaka, Akira, 4,705,989, Cl. 315-39.510.
Kovacic, Charles R.; and Noshay, David A., to Honeywell Inc. Pull station. 4,706,065, Cl. 340-303.000.
Kovacs, Istvan: *See*—
Madi-Szabo, Laszlo ; Morvai, Margit; Horvath nee Feher, Eva; Jansco, Sandor; Tamasi, Piroska; Kovacs, Istvan; Kiss nee Loss, Ilona Maria; Bacsa, Gyorgy; Kubala nee Papp, Maria; and Bene nee Horvath, Magdolna, 4,705,779, Cl. 514-27.000.
Kowalski, Werner: *See*—
Schimmel, Gunther; Kowalski, Werner; Heymer, Gero; and Gradl, Reinhard, 4,705,529, Cl. 23-293.00R.
Kozawa, Tetsuo: *See*—
Nomura, Etsuzo; Kozawa, Tetsuo; and Sakakibara, Yasuo, 4,704,978, Cl. 112-275.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Steven, Josef; and Hassfurther, Karl, 4,705,663, Cl. 376-442.000.
Kramer, Daniel P.: *See*—
Kelly, Michael D.; and Kramer, Daniel P., 4,705,585, Cl. 156-89.000.
Kramer, Francis A.: *See*—
Connors, Herman J., Jr.; and Kramer, Francis A., 4,705,071, Cl. 137-625.300.
Kratt, Alfred: *See*—
Plapp, Gunther; Zichner, Botho; Jautelat, Rudiger; Kohler, Rolf; Kratt, Alfred; and Muller, Hans-Martin, 4,705,007, Cl. 123-519.000.
Kratz, Bernhard; and Postler, Gunter, to Diehl GmbH & Co. Blind-setting device for a detonator. 4,704,965, Cl. 102-226.000.
Krechel, Joseph L.; Purvis, Michael J.; and Ross, Paul F., II, to Control Devices, Incorporated. Manifold fitting for a compressed air tank. 4,705,076, Cl. 137-883.000.
Krude, Werner, to GKN Automotive Components Inc. Independent wheel suspension system having a differential pivotable about two axes. 4,705,128, Cl. 180-73.300.
KSM Fastening Systems Inc.: *See*—
Raycher, Robert J.; and Pease, Charles C., 4,705,424, Cl. 403-266.000.
Kub, Francis J., to Westinghouse Electric Corp. Method of forming a lateral bipolar transistor in a groove. 4,704,786, Cl. 437-32.000.
Kubala nee Papp, Maria: *See*—
Madi-Szabo, Laszlo ; Morvai, Margit; Horvath nee Feher, Eva; Jansco, Sandor; Tamasi, Piroska; Kovacs, Istvan; Kiss nee Loss, Ilona Maria; Bacsa, Gyorgy; Kubala nee Papp, Maria; and Bene nee Horvath, Magdolna, 4,705,779, Cl. 514-27.000.
Kubick, Frederick, to United Technologies Corporation. Electro-optic beam scanner. 4,706,094, Cl. 343-754.000.
Kubik, Peter S.: *See*—
Budrikis, Zigmantas L.; Hatamian, Mehdi; Kubik, Peter S.; and Netravali, Arun N., 4,705,942, Cl. 250-227.000.
Kubo, Makoto: *See*—
Sotoya, Koshiro; Kubo, Makoto; and Okabe, Kazuhiko, 4,705,893, Cl. 562-564.000.
Kuchar, Dennis W. Ice fishing tip-up apparatus. 4,704,816, Cl. 43-17.000.
Kudo, Yasuichi, to Sanyo Special Steel. Rotating-probe defect detecting device. 4,706,022, Cl. 324-243.000.
Kudo, Yoshihisa, to NEC Corporation. Apparatus and method for generating multi-digit codes. 4,706,085, Cl. 342-825.560.
Kugelman, Michael M., to B.F. Goodrich Company, The. Noise tolerant fast acting optical overcurrent protector and method. 4,706,160, Cl. 361-100.000.
Kuhl, Jeffrey B. Apparatus for cleaning eggs. 4,704,755, Cl. 15-3.130.
Kuhlman, Michael J.: *See*—
Layman, Frederick P.; Huntley, David A.; Dick, Paul H.; Coad, George L.; Kuhlman, Michael J.; Vecta, Roger M.; and Hobson, Phillip M., 4,705,951, Cl. 250-442.100.
Kuka Schweissanlagen+ Roboter GmbH: *See*—
Zimmer, Ernst, 4,704,913, Cl. 74-89.170.

KUKA Schweissanlangen: *See*—
Hartmann, Georg; Wiedemann, Kurt; and Zimmer, Ernst, 4,705,243, Cl. 248-51.000.

Kukes, Simon G.: *See*—
Coombs, Daniel M.; Cymbaluk, Ted H.; Bertus, Brent J.; and Kukes, Simon G., 4,705,768, Cl. 502-213.000.
Howell, Jerald A.; and Kukes, Simon G., 4,705,766, Cl. 502-167.000.

Kumagai, Toru; and Kosugi, Yoshihiro, to Sony Corporation. Automatic setup system for controlling color gain, hue and white balance of TV monitor. 4,706,108, Cl. 358-10.000.

Kume, Hiroshi, to Fuji Xerox Co., Ltd. Digital signal transmission system. 4,706,246, Cl. 370-85.000.

Kummer, David A.; Saenz, Jesus A.; and Trynosky, Stephen W., to International Business Machines Corporation. Raster scan digital display system with digital comparator means. 4,706,079, Cl. 340-799.000.

Kumobayashi, Hidenori: *See*—
Okano, Tamon; Kumobayashi, Hidenori; Akutagawa, Susumu; Kiji, Jitsuo; Konishi, Hisatoshi; Fukuyama, Keiichi; and Shimano, Yasunobu, 4,705,895, Cl. 564-15.000.

Kundinger, Ernst F.; Klimesch, Erich; Zengel, Hans-Georg; and Lasher, Jeffery D., to Akzo NV. Flexible multi-layer polyimide laminates. 4,705,720, Cl. 428-332.000.

Kunimoto, Yuji: *See*—
Fujihara, Takeo; Yamatani, Akira; Yamamoto, Masanori; and Kunimoto, Yuji, 4,705,209, Cl. 229-109.000.

Kunz, Peter. Capacity-type position sensor for electromagnetic load-compensation weighing apparatus. 4,705,127, Cl. 177-212.000.

Kuo, Tai-Haur, to Industrial Technology Research Institute. Matching current source. 4,706,013, Cl. 323-316.000.

Kupersmit, Julius B. Multiple display carton shipping package. 4,705,162, Cl. 206-45.110.

Kupper, Philip L.; and Morgan, Dan R., to Procter & Gamble Co., The. Beverage opacifier. 4,705,691, Cl. 426-590.000.

Kurakake, Yasushi, to Nippon Gakki Seizo Kabushiki Kaisha. Apparatus for and method of producing automatic music accompaniment from stored accompaniment segments in an electronic musical instrument. 4,704,933, Cl. 84-1.030.

Kurashiki Boseki Kabushiki Kaisha: *See*—
Akiyama, Shigeo; and Satou, Shigeji, 4,705,224, Cl. 242-35.60E.

Kurata, Noboru, to Honda Giken Kogyo Kabushiki Kaisha. Power transmission device of four wheel drive vehicle. 4,704,920, Cl. 74-665.0GC.

Kurazono, Shuichi: *See*—
Mita, Hideo; and Kurazono, Shuichi, 4,705,097, Cl. 165-4.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Shimada, Masaaki; Saito, Koji; and Midorikawa, Yoshiaki, 4,705,702, Cl. 427-180.000.

Kurematsu, Masayuki: *See*—
Kobayashi, Kazuhiro; Koboshi, Shigeharu; Kuse, Satoru; Miyaoka, Kazuyoshi; and Kurematsu, Masayuki, 4,705,377, Cl. 354-322.000.
Kobayashi, Kazuhiro; Koboshi, Shigeharu; Kuse, Satoru; Miyaoka, Kazuyoshi; Kurematsu, Masayuki; and Uchida, Makoto, 4,705,379, Cl. 354-324.000.
Miyaoka, Kazuyoshi; Kobayashi, Kazuhiro; Kuse, Satoru; Kurematsu, Masayuki; and Koboshi, Shigeharu, 4,705,378, Cl. 354-324.000.

Kurohata, Hitoshi: *See*—
Masho, Yukio; Kakimi, Shigeru; Ueki, Toru; Miyauchi, Satoshi; Ohigashi, Tugio; and Kurohata, Hitoshi, 4,705,154, Cl. 194-319.000.

Kuroki, Junsuke: *See*—
Fukunaga, Yukio; Shibahata, Yasuji; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,705,130, Cl. 180-140.000.
Shibahata, Yasuji; Fukunaga, Yukio; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,705,131, Cl. 180-140.000.

Kurosawa, Susumu: *See*—
Terada, Kazuo; Kurosawa, Susumu; and Suzuki, Shunichi, 4,706,107, Cl. 357-23.500.

Kurose, Kazuyoshi: *See*—
Asada, Takafumi; Yoshida, Cyuryo; Shioyama, Tadao; and Kurose, Kazuyoshi, 4,706,143, Cl. 360-107.000.

Kuse, Satoru: *See*—
Kobayashi, Kazuhiro; Koboshi, Shigeharu; Kuse, Satoru; Miyaoka, Kazuyoshi; and Kurematsu, Masayuki, 4,705,377, Cl. 354-322.000.
Kobayashi, Kazuhiro; Koboshi, Shigeharu; Kuse, Satoru; Miyaoka, Kazuyoshi; Kurematsu, Masayuki; and Uchida, Makoto, 4,705,379, Cl. 354-324.000.
Miyaoka, Kazuyoshi; Kobayashi, Kazuhiro; Kuse, Satoru; Kurematsu, Masayuki; and Koboshi, Shigeharu, 4,705,378, Cl. 354-324.000.

Kushida, Noritaka: *See*—
Kawanabe, Tomohiko; Asakura, Masahiko; Kushida, Noritaka; Shiina, Takanori; and Muroya, Minoru, 4,705,012, Cl. 123-589.000.

Kuszewski, James R.: *See*—
Lewis, David F.; and Kuszewski, James R., 4,705,741, Cl. 430-333.000.

Kuwabara, Kiyoharu: *See*—
Hayashi, Atsushi; Kuwabara, Kiyoharu; Sakai, Kohzo; and Ishino, Toshihiro, 4,705,763, Cl. 501-103.000.

Kuwagaki, Hiroshi: *See*—
Funada, Fumiaki; Kuwagaki, Hiroshi; Yamamoto, Kunihiko; and Matsuura, Masataka, 4,705,360, Cl. 350-344.000.

Kuwajima, Teruaki: *See*—
Ito, Takeyasu; and Kuwajima, Teruaki, 4,705,821, Cl. 524-407.000.

Kwack, Tae H.; and Su, Tien-Kuei, to Mobil Oil Corporation. Low density polyethylene resin compositions and thermoplastic films thereof. 4,705,829, Cl. 525-240.000.

Kwiatkowski, George: *See*—
Hughes, John L.; Irons, Frank E.; and Kwiatkowski, George, 4,705,036, Cl. 128-303.100.

Kwiatkowski, Jean-Claude; and Imbert, Guy, to U.S. Philips Corporation. Darlington type switching stage for a line decoder of a memory. 4,706,222, Cl. 365-230.000.

Kyocera Corporation: *See*—
Nishiguchi, Yasuo; Minami, Keijirou; and Hoda, Masakazu, 4,705,697, Cl. 427-36.000.

Labaw, Clifford S.; and Tremper, Alan W., to SmithKline Beckman Corporation. Chemical processes for 2-(2-halo-3,4-dimethoxybenzyl)-5-(4-methoxyphenyl)oxazolidines. 4,705,862, Cl. 548-215.000.

Laboratoire L. Lafon: *See*—
Lafon, Louis, 4,705,795, Cl. 514-317.000.

Laccetti, Anthony J.: *See*—
Gregor, Harry P.; Dalven, Paul I.; Hildebrandt, James R.; Hodgins, Leonard T.; Laccetti, Anthony J.; and Shamir, Abraham, 4,705,753, Cl. 435-180.000.

Lafon, Louis, to Laboratoire L. Lafon. (2,4,6-trimethoxyphenyl)-(3-piperidinopropyl)-ketone derivatives. 4,705,795, Cl. 514-317.000.

Laing, Gordon E.: *See*—
Rotola, Louis A., Jr.; and Laing, Gordon E., 4,705,547, Cl. 55-374.000.

Laitram Corporation, The: *See*—
Lapeyre, James M., 4,705,372, Cl. 354-106.000.

Lak, Khosrow: *See*—
Palm, Charles S.; Slayton, Danny L.; Lak, Khosrow; Sampson, Peter F.; Davis, David R.; Wheatley, Maurice S., Jr.; Chatham, Gregory A.; Jones, Wayne C.; Charles, Kirk W.; and Ireland, Anthony J., 4,705,385, Cl. 355-4.000.

Lalere, Jean C.: *See*—
Frizot, Alain; Cadaureille, Gerard; Lalere, Jean C.; and Machuron, Jean-Yves, 4,704,801, Cl. 33-502.000.

Lamer, Gerald P.; Lenius, Norbert W.; and Stearn, Richard A., to Marine Travelift, Inc. Suspended load positioning stabilizing system. 4,705,180, Cl. 212-190.000.

Lammens, Robert: *See*—
Grohe, Klaus; and Lammens, Robert, 4,705,789, Cl. 514-254.000.

Lampiano, Piero: *See*—
Astegiano, Luciano; Bertoglio, Ottavio; Bosco, Fulvio; de Bosio, Alfredo; Franco, Dario; Lampiano, Piero; Melle, Antonio; and Rosboch, Luciano, 4,706,270, Cl. 379-2.000.

Lamprecht, Helmut: *See*—
Schatz, Oskar, 4,704,868, Cl. 60-620.000.

Lane, Elvin. Heat unit recycler. 4,705,213, Cl. 237-7.000.

Lane, Kimberley J.; and Traver, Frank J., to General Electric Company. Novel aminofunctional polysiloxane emulsions for treating textiles. 4,705,704, Cl. 427-389.900.

Lang, Robert W.: *See*—
Martin, Pierre; and Lang, Robert W., 4,705,801, Cl. 514-423.000.

Lange, Gerhard; and Weil, Erich, to Siemens Aktiengesellschaft. Filling compound for optical waveguide buffer and/or optical waveguide cables. 4,705,571, Cl. 106-287.100.

Lange, Peter M.: *See*—
Heller, Harold; Lange, Peter M.; and Martinola, Friedrich, 4,705,637, Cl. 210-670.000.

Langenbeck, Keith A. Beverage tray packing system. 4,704,841, Cl. 53-448.000.

Langer, Werner: *See*—
Graser, Franz; Langer, Werner; and Nowak, Reiner, 4,705,210, Cl. 239-585.000.

Langley, John: *See*—
Symes, Kenneth C.; Langley, John; and Mistry, Kishor K., 4,705,825, Cl. 524-732.000.

Lanier, David C.: *See*—
Williams, Clarence O.; and Lanier, David C., 4,704,756, Cl. 15-21.00R.

Lanteri, Pierre: *See*—
Longeray, Remi; Lanteri, Pierre; Mathia, Thomas; Jodelet, Francois; and Segura, Serge, 4,705,815, Cl. 521-160.000.

Lanzisera, Vincent A.: *See*—
Su, Chin B.; Lanzisera, Vincent A.; and Freeman, Richard I., 4,706,253, Cl. 372-44.000.

Lapeyre, James M., to Laitram Corporation, The. Camera for recording keyboard entry of data on film edge. 4,705,372, Cl. 354-106.000.

Larkin, John M.: *See*—
Sanderson, John R.; and Larkin, John M., 4,705,903, Cl. 568-922.000.

Lasher, Jeffery D.: *See*—
Kundinger, Ernst F.; Klimesch, Erich; Zengel, Hans-Georg; and Lasher, Jeffery D., 4,705,720, Cl. 428-332.000.

Lathery, Willie M.: *See*—
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,704,976, Cl. 112-262.200.

Lathrum, Wilford D. Easy outboard motor loader. 4,705,179, Cl. 212-182.000.

Lau, Catherine Y., to Ortho Pharmaceutical (Canada) Ltd. Treatment of autoimmune diseases such as rheumatoid arthritis with suppressor factor. 4,705,687, Cl. 424-95.000.

Lau, John R.: *See*—
Geho, W. Blair; Lau, John R.; and Jacob, Joseph, 4,705,804, Cl. 514-474.000.

Lauchenauer, Alfred E., to Jacob Schlaepfer & Co., AG. Application of polymeric materials to substrates. 4,705,584, Cl. 156-79.000.

Laun, Martin: *See*—
Warzelhan, Volker; Bachl, Robert; Ball, Wolfgang; Funk, Guido; and Laun, Martin, 4,705,835, Cl. 526-116.000.

Laureate Innovations, Inc.: *See*—
Lubeck, Joseph G., 4,705,274, Cl. 273-148.00R.

Lauritano, Giuseppe. Tool for torquing rotatable members. 4,704,779, Cl. 29-240.000.

Lautenschlager, Hans-Heiner; Parnham, Michael J.; Leyck, Sigurd; Winkelmann, Johannes; and Brekle, Axel, to A. Nattermann & CIE GmbH. Omega-aryl-alkylthienyl-compounds and process for the treatment of chronically inflammatory processes in humans. 4,705,802, Cl. 514-438.000.

Lauzier, Rene; Rollin, Jean; Choquelle, Jean; Dumas, Gerard; Breat, Francois; Rousson, Maurice; and Defour, Paule, to Etablissements Lauzier; Ateliers de la Rive; Bador S.A.; and Angenieux-CLB S.A. Bicycle frame. 4,705,286, Cl. 280-281.00R.

Lawrence, Carl A., to National Research Development Corporation. Spinning of yarn. 4,704,853, Cl. 57-401.000.

Lawrence Paper Company: *See*—
Creaden, David E., 4,705,170, Cl. 206-419.000.

Layman, Frederick P.; Huntley, David A.; Dick, Paul H.; Coad, George L.; Kuhlman, Michael J.; Vecta, Roger M.; and Hobson, Phillip M., to Varian Associates, Inc. Wafer processing system. 4,705,951, Cl. 250-442.100.

Lazaro, Eric J.: *See*—
Spillert, Charles R.; Suval, William D.; and Lazaro, Eric J., 4,705,756, Cl. 436-64.000.

Lebizay, Gerald; Lien, Yeong-Chang L.; and Yu, Philip S., to International Business Machines Corporation. Switching protocal for multiple autonomous switching planes. 4,706,150, Cl. 340-825.500.

Lebo Peerless, Inc.: *See*—
Mastronardo, Patrick, 4,705,169, Cl. 206-387.000.

Lebowitz, Samuel. Orientable lamp. 4,706,172, Cl. 362-270.000.

LeBreton, Edward T., to Essef Corporation. Apparatus for rotationally casting a plastic tank liner having an access fitting. 4,705,468, Cl. 425-116.000.

Lecerf, Jean-Pierre; Favey, Charles; and Meurice, Pierre, to Centre Technique des Industries Mecaniques. Electrofluidic transducer of the nozzle/plate type and hydraulic servo-valve equipped with such a transducer. 4,705,059, Cl. 137-82.000.

Ledent, Pierre; and Sonntag, Claus, to Institution pour le Developpement de la Gazeification Souterraine. Controlled retracting gasifying agent injection point process for UCG sites. 4,705,109, Cl. 166-251.000.

Lee, Chi-Long: *See*—
Gornowicz, Gerald A.; and Lee, Chi-Long, 4,705,877, Cl. 556-422.000.
Gornowicz, Gerald A.; and Lee, Chi-Long, 4,705,878, Cl. 556-422.000.

Lee, Kang I.; and Jopson, Harriet, to GTE Laboratories Incorporated. Method for preparing an electrically conductive polymer blend. 4,705,645, Cl. 252-500.000.

Lefevre, Herve : *See*—
Graindorge, Philippe; Arditty, Herve ; and Lefevre, Herve , 4,705,399, Cl. 356-350.000.

Leggett & Platt, Incorporated: *See*—
Higgins, Larry, 4,705,079, Cl. 140-3.0CA.
Yates, Chester R.; and Bruner, Maurice M., 4,704,752, Cl. 5-247.000.

Lehmann, Helmuth: *See*—
Christ, Alfred; Lehmann, Helmuth; and Spiewok, Leonhard, 4,704,879, Cl. 68-140.000.

Lehmann, Klaus; Dreher, Dieter; and Goetz, Harry, to Rohm GmbH Chemische Fabrik. Method for coating pharmaceutical formulations. 4,705,695, Cl. 427-3.000.

Lehmann, Leonard T.: *See*—
Wang, David W.; Casey, Donald J.; and Lehmann, Leonard T., 4,705,820, Cl. 524-381.000.

Lehmann, Paul: *See*—
Willnow, Peter; Lehmann, Paul; Ziegenhorn, Joachim; and Wahlefeld, August W., 4,705,749, Cl. 435-15.000.

Lehner, Martin: *See*—
Keller, Heinz; Brocker, Heinz; and Lehner, Martin, 4,705,608, Cl. 204-28.000.

Lehrer, Robert I.; Selsted, Michael E.; and Ganz, Tomas, to University of California, The Regents of the. Cationic oligopeptides having microbicidal activity. 4,705,777, Cl. 514-12.000.

Leigh-Monstevens, Keith V.; Nix, Richard A.; and Patalidis, Claude A., deceased (by Patalidis, Monique, executrix), to Automotive Product plc. Hydraulic slave cylinder interlock switching device with proximity sensor. 4,705,151, Cl. 192-111.00A.

Leighton, Harry J., to Burroughs Wellcome Co. Phenothiazine compounds. 4,705,854, Cl. 544-41.000.

Le-Khac, Bi, to Atlantic Richfield Company. Water absorbent polymer composition. 4,705,773, Cl. 502-402.000.

Lemarquis, Jean-Claude: *See*—
Dolhen, Gerard; Oberlin, Claude; Lemarquis, Jean-Claude; and Bandura, Daniel, 4,705,259, Cl. 251-61.100.

Lenius, Norbert W.: *See*—
Lamer, Gerald P.; Lenius, Norbert W.; and Stearn, Richard A., 4,705,180, Cl. 212-190.000.

Leo, Cosmo L.; and Stefanick, Stanley W., to Digital Equipment Corporation. Shock and vibration isolation mounting. 4,705,257, Cl. 248-611.000.

Leonardi, Amedeo: *See*—
Nardi, Dante; Leonardi, Amedeo; Graziani, Gabriele; and Bianchi, Giorgio, 4,705,797, Cl. 514-356.000.

Lerner, Lawrence; and Diskin, Stephen P., to MEGA/ERG Inc. Power cord, wire and cable container. 4,705,484, Cl. 439-502.000.

Leseur, Philippe: *See*—
Buttazzoni, Bernard; Leseur, Philippe; Thebault, Jacques; and Constant, Georges, deceased, 4,705,694, Cl. 427-2.000.

Lespinasse, Patrick: *See*—
Maures, Michel; Pasdeloup, Jacques; and Lespinasse, Patrick, 4,705,655, Cl. 264-3.400.

Leute, Ulrich: *See*—
Reichert, Karl-Heinz; Schoeppel, Wolfgang; Ewangelidis, Stawros; Bednarz, Jurgen; and Leute, Ulrich, 4,705,648, Cl. 252-512.000.

Lev, Monick; and Frankstein, Brois, to State of Israel-Ministry of Agriculture. Apparatus for sorting and bunching flowers and other agricultural produce. 4,704,846, Cl. 53-522.000.

Levendusky, Thomas L.; Benson, Arthur; and Lunden, Richard W., to Aluminum Company of America. Cooking utensil for combined microwave and steam cooking. 4,705,927, Cl. 219-10.55E.

Levenson, Corey H.; and Mullis, Kary B., to Cetus Corporation. Precursor to nucleic acid probe. 4,705,886, Cl. 560-159.000.

Lewis, David F.; and Kuszewski, James R., to GAF Corporation. Processless color imaging and film therefor. 4,705,741, Cl. 430-333.000.

Lewis, David F., to GAF Corporation. Processless multicolor imaging. 4,705,742, Cl. 430-333.000.

Lewis, Larry N., to General Electric Company. Hydrosilylation catalyst, method for making and use. 4,705,765, Cl. 502-152.000.

Lewis, Lindon L.: *See*—
Stein, Samuel R.; Lewis, Lindon L.; and Smith, Thomas E., 4,706,043, Cl. 331-94.100.

Lewis, Roger L., to Federal-Mogul Corporation. Stress resistant abrasive cutting wheel. 4,705,017, Cl. 125-15.000.

Leyck, Sigurd: *See*—
Lautenschlager, Hans-Heiner; Parnham, Michael J.; Leyck, Sigurd; Winkelmann, Johannes; and Brekle, Axel, 4,705,802, Cl. 514-438.000.

Lezak, Tibor: *See*—
Kaffka, Karoly; Lezak, Tibor; Striker, Gyorgy; and Zeisel, Eva, 4,705,216, Cl. 239-18.000.

L'Henaff, Patrick; and Bricaud, Herve, to Amphenol Corporation. Printed circuit card with heat exchanger and method for making such a card. 4,706,164, Cl. 361-382.000.

Li, Kin: *See*—
Young, Peter L.; Cech, Jay; and Li, Kin, 4,705,606, Cl. 204-15.000.

Libbey-Owens-Ford Co.: *See*—
Curtze, Edward W., 4,704,987, Cl. 118-500.000.

Lidow, Alexander; and Herman, Thomas, to International Rectifier Corporation. High power MOSFET with low on-resistance and high breakdown voltage. 4,705,759, Cl. 437-29.000.

Liebes, Sidney, Jr.: *See*—
Birk, John; Breu, Heinz; Gong, William; Morehouse, Charles C.; and Liebes, Sidney, Jr., 4,705,081, Cl. 140-147.000.

Liebl, Rudolf; and Bosshard, Ernst, to EgoKiefer AG. Apparatus for making a flexible link belt. 4,705,469, Cl. 425-117.000.

Lied, Thomas: *See*—
Giray, Guenes; Huthmacher, Klaus; Kleemann, Axel; and Lied, Thomas, 4,705,867, Cl. 549-39.000.

Lien, Yeong-Chang L.: *See*—
Lebizay, Gerald; Lien, Yeong-Chang L.; and Yu, Philip S., 4,706,150, Cl. 340-825.500.

Lilja, Launo L.: *See*—
Honkaniemi, Matti E.; Mustikka, Lauri A.; Jankkila, Martti J.; Hokkanen, Pentti O.; Heikkila , Risto M.; and Lilja, Launo L., 4,705,474, Cl. 432-14.000.

Lilly Industries Limited: *See*—
Horwell, David C.; and Timms, Graham H., 4,705,807, Cl. 514-650.000.

Lim, Wah L.; Hauck, James P.; and Raquet, Jack W., to Northrop Corporation. Pentagonal ring laser gyro design. 4,705,398, Cl. 356-350.000.

Lin, Frank H.: *See*—
Olesen, Paul; and Lin, Frank H., 4,705,202, Cl. 227-153.000.

Lin, Hong Yue. Method and apparatus evaluating auditory distortions of an audio system. 4,706,290, Cl. 381-58.000.

Lin, Jui-Chin, to Shinn Fu Corporation. Transmission mechanism for gymnastic bicycle. 4,705,493, Cl. 474-69.000.

Lin, Kou C.; Burkhardt, Charles E.; and Sheppard, Harry R., to Westinghouse Electric Corp. Method of constructing a magnetic core. 4,705,578, Cl. 148-108.000.

Lin, Min-Shin. Warning apparatus against the coverlet out of position. 4,706,071, Cl. 340-568.000.

Lin, Shiow C., to W. R. Grace & Co. Poly(5-imidazolone) and process therefor. 4,705,824, Cl. 524-612.000.

Lin, Ying-wei, to Xerox Corporation. Cleaning apparatus for charge retentive surface. 4,705,387, Cl. 355-15.000.

Linde Aktiengesellschaft: *See*—
Reimann, Hans; and Wildmoser, Alfred, 4,705,634, Cl. 210-616.000.

Sapper, Rainer, 4,705,549, Cl. 62-30.000.

Lindemann, Karl-Heinz: *See*—
Klos, Klaus-Peter; Lindemann, Karl-Heinz; and Birnstiel, Willi, 4,705,576, Cl. 148-6.200.

Lindenthal, Hans, to J. M. Voith GmbH. Hooke's-type joint for a universal shaft. 4,705,490, Cl. 464-132.000.

Lindmayer, Joseph, to Quantex Corporation. Communications apparatus using infrared-triggered phosphor for receiving infrared signals. 4,705,952, Cl. 250-484.100.

Linker, Frank V.; and Linker, Frank V., Jr., to American Tech Manufacturing, Inc. Switch track assembly for high-speed handling of electronic components. 4,705,152, Cl. 193-39.000.

Linker, Frank V., Jr.: *See*—
Linker, Frank V.; and Linker, Frank V., Jr., 4,705,152, Cl. 193-39.000.

Linn, Thomas D., to Boston Digital Corporation. Enclosure for a machine tool. 4,705,187, Cl. 220-333.000.

Lipes, Arnold; and Soga, George, to Packaging Automation Machinery Co. Ltd. Fused plastic bag closure and apparatus for making same. 4,706,298, Cl. 383-71.000.

Lipovac, Vincent: *See*—
Pouget, Jacques; Lipovac, Vincent; and de Mauduit, Yves, 4,705,586, Cl. 156-242.000.

Lipp, Charles W., to Dow Chemical Company, The. Nozzle for achieving constant mixing energy. 4,705,535, Cl. 48-77.000.

Liska, Timothy J.; and Scott, Paul F., to Emhart Industries, Inc. Glassware forming apparatus with distributed control. 4,705,552, Cl. 65-158.000.

List, Helmut: *See*—
Marsoner, Hermann; Kirchmayer, Gerald; and List, Helmut, 4,704,893, Cl. 73-1.00G.

Little, William E.; and McLendon, Thomas R., to United States of America, Energy. Method for in situ heating of hydrocarbonaceous formations. 4,705,108, Cl. 166-248.000.

Litton Systems, Inc.: *See*—
Sturza, Mark A., 4,706,286, Cl. 380-34.000.

Liu, Dean-Yuan: *See*—
Guy, Jon S.; Liu, Dean-Yuan; and Sholtis, Albert A., 4,705,414, Cl. 400-120.000.

Locacius, Robert F.; and Zelenka, Terence, to Fel-Pro Incorporated. Selectively compressed expanded graphite gasket and method of making same. 4,705,278, Cl. 277-235.00B.

Lockey, Joseph, to Coal Industry (Patents) Limited. Collar splitters for lock bolt fastening systems. 4,704,793, Cl. 30-187.000.

Lockheed Corporation: *See*—
Halfpenny, Paul F., 4,705,033, Cl. 128-201.130.

Logan, Robert T.; Redpath, James; and Roy, Robert G., to Akzo N.V. Indene and naphthalene derivatives. 4,705,782, Cl. 514-150.000.

Lok, Kar P.: *See*—
Hair, Michael L.; Lok, Kar P.; and Winnik, Francoise M., 4,705,567, Cl. 106-20.000.

Loken, Michael R.: *See*—
Recktenwald, Diether J.; Kerndt, Rickie S.; Loken, Michael R.; and Chen, Chia H., 4,704,891, Cl. 73-1.00R.

London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, to Sara Lee Corporation. Method and apparatus for forming and presenting bias cut gussets in the formation of panty hose garments. 4,704,976, Cl. 112-262.200.

Longeray, Remi; Lanteri, Pierre; Mathia, Thomas; Jodelet, Francois; and Segura, Serge, to Skis Rossignol SA. Antireverse running-surface treatment for cross-country skis. 4,705,815, Cl. 521-160.000.

Loose, Gunter: *See*—
Abthoff, Joerg; Schuster, Hans-Dieter; Loose, Gunter; and Jokl, Bernhard, 4,704,863, Cl. 60-311.000.

Loose, Winfield W., to AMP Incorporated. Insulation displacing barrel terminal. 4,705,340, Cl. 439-395.000.

L'Oreal: *See*—
Goncalves, Antonin, 4,705,053, Cl. 132-88.700.

Loucks, Bryan E.: *See*—
Harshberger, Robert P., Jr.; Loucks, Bryan E.; and Witte, Kenneth G., 4,705,996, Cl. 318-160.000.

Lovrenich, Rodger T. Control device including a conductively isolated depluggable controller. 4,705,960, Cl. 307-149.000.

Lowe, Barrie M.: *See*—
Araya, Abraham; and Lowe, Barrie M., 4,705,674, Cl. 423-277.000.

Lowe, Laban R.: *See*—
Milstead, Leon R.; Lowe, Laban R.; Schnepfe, Robert W., Jr.; and Erickson, Merlin L., 4,704,967, Cl. 102-334.000.

Lubeck, Joseph G., to Laureate Innovations, Inc. Retractable seat for gaming devices. 4,705,274, Cl. 273-148.00R.

Lucas Industries Plc: *See*—
Smith, Sidney B., 4,706,179, Cl. 363-126.000.

Lucerne Products, Inc.: *See*—
Sahrbacker, Edward V., 4,705,920, Cl. 200-43.040.

Lukas, Stephen, to Capsule Technology International, Ltd. Method for drying gelatin in the manufacture of hard shell gelatin capsules. 4,705,658, Cl. 264-25.000.

Lunden, Richard W.: *See*—
Levendusky, Thomas L.; Benson, Arthur; and Lunden, Richard W., 4,705,927, Cl. 219-10.55E.

Lunt, Audrey T. Fitted crib or bed sheet. 4,704,753, Cl. 5-484.000.

M.G.S. Manufacturing, Inc.: *See*—
Williams, Dean L., 4,704,854, Cl. 57-58.340.

Mabru, Michel: *See*—
Brunet, Henri; Mabru, Michel; and Gastaud, Michel, 4,706,257, Cl. 372-88.000.

Mabuchi Motor Co., Ltd.: *See*—
Mabuchi, Takaichi, 4,705,978, Cl. 310-248.000.

Mabuchi, Takaichi, to Mabuchi Motor Co., Ltd. Brushgear for miniature motors. 4,705,978, Cl. 310-248.000.

Machida, Kazumichi: *See*—
Hirota, Jitsuho; Machida, Kazumichi; and Watanabe, Noriko, 4,705,204, Cl. 228-179.000.

Machida, Tetsuo; and Ozawa, Kazuo, to Sony Corporation. Tape cassette. 4,706,149, Cl. 360-132.000.

Machines Outils Wirth et Gruffat: *See*—
Quinart, Pierre; Schoellhammer, Georges; Tableau, Pierre; and Vivien, Francois, 4,704,773, Cl. 29-27.00C.

Machuron, Jean-Yves: *See*—
Frizot, Alain; Cadaureille, Gerard; Lalere, Jean C.; and Machuron, Jean-Yves, 4,704,801, Cl. 33-502.000.

Mada, Yoshikazu: *See*—
Shibata, Takashi; Yamada, Nobuo; Mada, Yoshikazu; and Iizima, Masaki, 4,705,977, Cl. 310-235.000.

Madi-Szabo, Laszlo ; Morvai, Margit; Horvath nee Feher, Eva; Jansco, Sandor; Tamasi, Piroska; Kovacs, Istvan; Kiss nee Loss, Ilona Maria; Bacsa, Gyorgy; Kubala nee Papp, Maria; and Bene nee Horvath, Magdolna, to Biogal Gyogyszergyar of Debrecen and Alkaloida Vegyeszeti Gyar of Tiszavasvari. Pharmaceutical compositions of anti-pancreatic inflammatory effect. 4,705,779, Cl. 514-27.000.

Madion, Herbert E. Emergency v-belt. 4,705,495, Cl. 474-255.000.

Maeda, Akira, to Yazaki Corporation. Electrical connector housing. 4,705,337, Cl. 439-595.000.

Maeda, Masaya, to Canon Kabushiki Kaisha. Magnetic recording and reproducing apparatus. 4,706,139, Cl. 360-71.000.

Maekawa, Nobuteru: *See*—
Sainomoto, Yoshinori; and Maekawa, Nobuteru, 4,706,153, Cl. 361-42.000.

Maekawa, Yoshikazu; and Okui, Susumu, to Konishiroku Photo Ind. Co., Ltd. Method for both-side copying and apparatus therefore. 4,705,389, Cl. 355-26.000.

Maes, Daniel; and Brudney, Norman, to Richardson-Vicks Limited. Hair treating composition. 4,705,681, Cl. 424-70.000.

Magadini, Charles R. Increasing the load carrying capacity of beams. 4,704,830, Cl. 52-226.000.

Magnavox Government and Industrial Electronics Company: *See*—
Congdon, John C., 4,706,229, Cl. 367-159.000.

Magne, Francois, to U.S. Philips Corporation. Arrangement for measuring velocity with respect to a surface. 4,706,092, Cl. 342-109.000.

Maher, Galeb H., to Sprague Electric Company. Capacitor with dielectric of PLZT and an intergranular borate. 4,706,163, Cl. 361-321.000.

Mahlberg, Gunther: *See*—
Klotzer, Sieghart; Mucke, Bruno; Mahlberg, Gunther; and Becker, Manfred, 4,705,747, Cl. 430-550.000.

Mahle GmbH: *See*—
Ripberger, Emil; Stuska, Gotthard; and Ulrich, Reiner, 4,704,950, Cl. 92-208.000.

MAHO Aktiengesellschaft: *See*—
Babel, Werner, 4,705,440, Cl. 409-233.000.

Maiese, William M.: *See*—
Carter, Guy T.; Greenstein, Michael; Goodman, Joseph J.; Borders, Donald B.; Maiese, William M.; and Testa, Raymond T., 4,705,688, Cl. 424-122.000.

Maitre, Pierre: *See*—
Besson, Raymond; Delaite, Richard; Genestier, Gerard; Maitre, Pierre; Renard, Georges; Thiebaud, Daniel; and Valentin, Jean-Pascal, 4,705,982, Cl. 310-356.000.

Makari, Jack G. Immunization. 4,705,677, Cl. 424-1.100.

Makihara, Hiroshi: *See*—
Niwa, Kensuke; Fujita, Hisayoshi; Saito, Yoshihiko; Makihara, Hiroshi; Hashimoto, Ritsuo; Hoshi, Younosuke; and Murayama, Katsutoshi, 4,705,654, Cl. 261-128.000.

Makino, Hiroshi: *See*—
Onoyama, Takashi; and Makino, Hiroshi, 4,705,656, Cl. 264-8.000.

Makishima, Tokuo, to Toa Nenryo Kogyo Kabushiki Kaisha. Block copolymer containing tetrahydrofuran block. 4,705,830, Cl. 525-333.400.

Malik, Arshad H., to A. E. Staley Manufacturing Company. Method for inhibiting oxidation of ferrous metals with alkyl glycosides and composition for cleaning ferrous metals. 4,705,665, Cl. 422-12.000.

Mallard, John R.: *See*—
Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., 4,706,025, Cl. 324-309.000.

Mallinckrodt, Inc.: *See*—
Goedemans, Wilhelmus T., 4,705,678, Cl. 424-1.100.
Stade, John H., 4,705,509, Cl. 604-154.000.

Mamish, Abboud L.: *See*—
DeCoste, Leonard D., Jr.; and Mamish, Abboud L., 4,705,715, Cl. 428-246.000.

Mancini, Derek. Packaging machine. 4,704,844, Cl. 53-453.000.

Mangler, Rolf: *See*—
Fleischer, Klaus; Gohler, Peter; Mangler, Rolf; Reuther, Christian; Schingnitz, Manfred; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir; Fedotov, Vasilij; and Rodionov, Boris, 4,704,971, Cl. 110-264.000.

Mani, Inder: *See*—
Small, Hamish; and Mani, Inder, 4,705,636, Cl. 210-638.000.

Maniwa, Hideyo: *See*—
Ohtsuka, Masasuke; Harada, Yoshinori; Tokita, Shigeo; and Maniwa, Hideyo, 4,705,836, Cl. 526-318.100.

Mannesmann Rexroth GmbH: *See*—
Fertig, Gunter, 4,705,069, Cl. 137-596.000.
Wusthof, Peter; and Cunningham, Sinclair, 4,704,948, Cl. 92-58.000.

Mannherz, Elmer D.; Schmoock, Roy F.; and Shauger, Herbert A., to Fischer & Porter Company. Electromagnetic flowmeter with triangular flux drive. 4,704,907, Cl. 73-861.170.

Mannle, Erik; and Bauer, Peter-Josef, to Robert Bosch GmbH. Potentiometer. 4,706,062, Cl. 338-172.000.

Manor, Gedalyahu, to Technion Research & Development Foundation. Agricultural transport system. 4,704,851, Cl. 56-328.0TS.

Manville Corporation: *See*—
Kiedaisch, Randall A., 4,705,208, Cl. 229-120.080.

Manzoni-Bouchot: *See*—
Manzoni, Stephane, 4,705,368, Cl. 350-632.000.

Manzoni, Stephane, to Manzoni-Bouchot. Anti-vibration device for vehicle rearview mirror. 4,705,368, Cl. 350-632.000.

Maravetz, Lester L., to FMC Corporation. Herbicidal 1-aryl-Δ^2-1,2,4-triazolin-5-ones and sulfur analogs thereof. 4,705,557, Cl. 71-92.000.

Marchand, Denis, to Societe dite: SOGEA. Method and apparatus for reducing acid pollutants in smoke. 4,704,972, Cl. 110-345.000.

Marcon, Joel M.; Durant, Jacques A.; and Simon, Georges H., to Etat Francais. Controlled percussion device for automatic weapon. 4,704,945, Cl. 89-185.000.

Marek, Rainer, to Windmoller & Holscher. Apparatus for automatically controlling the temperature of welding bands. 4,705,937, Cl. 219-497.000.

Maresca, Louis M.: *See*—
Kawakami, James H.; Harris, James E.; Maresca, Louis M.; Robeson, Lloyd M.; and Cotter, Robert J., 4,705,822, Cl. 524-425.000.

Margolin, Mark; and Grois, Igor, to Amphenol Corporation. Fiber optic connector. 4,705,352, Cl. 350-96.200.

Marine Travelift, Inc.: *See*—
Lamer, Gerald P.; Lenius, Norbert W.; and Stearn, Richard A., 4,705,180, Cl. 212-190.000.

Markham, Charles W. Moisture-activated floatation device. 4,705,050, Cl. 128-749.000.

Marklew, David S., to Glynwed Tubes and Fittings Limited. Plug valve. 4,705,058, Cl. 137-15.000.

Markow, Edward G., to Grumman Aerospace Corporation. Convoluted cone wheel. 4,705,087, Cl. 152-5.000.

Maron, Melvin J. Process of teaching. 4,705,479, Cl. 434-335.000.

Marsoner, Hermann; Kirchmayer, Gerald; and List, Helmut, to AVL AG. Device for equilibrating a liquid reagent. 4,704,893, Cl. 73-1.00G.

Marsoner, Hermann; and Kleinhappl, Erich, to AVL AG. Analyzing apparatus for measuring liquid or gaseous samples. 4,705,667, Cl. 422-68.000.

Martin, Glenn E., to BASF Corporation, Inmont Division. Urethane nonaqueous dispersion for automotive base coat/clear coat applications. 4,705,839, Cl. 528-49.000.

Martin, Jose R.: *See*—
Barone, Hector D.; and Martin, Jose R., 4,705,516, Cl. 623-2.000.

Martin, Pierre; and Lang, Robert W., to Ciba-Geigy Corporation. Production for producing 3-cyano-4-phenyl indoles and intermediates. 4,705,801, Cl. 514-423.000.

Martinola, Friedrich: *See*—
Heller, Harold; Lange, Peter M.; and Martinola, Friedrich, 4,705,637, Cl. 210-670.000.

Maruyama, Kenji; and Kobayashi, Takehiro, to Ryobi Ltd. Spinning reel having improved bail arm mechanism. 4,705,228, Cl. 242-84.20G.

Maruyasu Industries Co., Ltd.: *See*—
Saotome, Kaoru; Sasaki, Hiroyuki; and Kanbara, Katsuhiro, 4,705,244, Cl. 248-68.100.

Maruzen Petrochemical Co., Ltd.: *See*—
Tsuchitani, Masatoshi; and Nakajima, Ryoichi, 4,705,618, Cl. 208-44.000.

Masai, Naruhito: *See*—
Yamada, Hirotada; Masai, Naruhito; Ueda, Sinji; Okuda, Takao; Fukasawa, Masatomo; Kato, Masuhiro; and Fukumura, Masataka, 4,705,784, Cl. 514-202.000.

Masak, Raymond J.: *See*—
Torre, Frank M.; Crush, John F.; and Masak, Raymond J., 4,706,261, Cl. 375-27.000.

Masakazu, Kikuchi; and Kazuo, Nakahama, to Takeda Chemical Industries, Ltd. Promoter plasmid containing the promoter and use thereof in transforming Bacillus. 4,705,750, Cl. 435-68.000.

Masaki, Yoshifumi, to Sharp Kabushiki Kaisha. Semiconductor integrated circuit with error correction function incorporated therein. 4,706,248, Cl. 371-3.000.

Masateru, Miyano; and Shone, Robert L., to G. D. Searle & Co. Aralkoxy and aryloxyalkoxy kojic acid derivatives. 4,705,871, Cl. 549-417.000.

Masco Corporation: *See*—
Fowler, James M., 4,705,936, Cl. 219-295.000.

Masho, Yukio; Kakimi, Shigeru; Ueki, Toru; Miyauchi, Satoshi; Ohigashi, Tugio; and Kurohata, Hitoshi, to Matsushita Electric Industrial Co. Ltd. Coin selection apparatus. 4,705,154, Cl. 194-319.000.

Massachusetts Institute of Technology: *See*—
Seyferth, Dietmar; Yu, Yuan-Fu; and Targos, Tom S., 4,705,837, Cl. 528-31.000.

Massengale, James. Bowling shoe protector. 4,704,810, Cl. 36-130.000.

Masson, Jean-Rene: *See*—
Poirier, Clovis; Banville, Marcel; McDonald, Mario; McDonald, Sabin; Johnston, Stephen; and Masson, Jean-Rene, 4,704,815, Cl. 43-4.000.

Massot, Jacqueline O.; and Astoin, Jaques N., to Univablot. Medicaments containing pichia or extracts thereof. 4,705,780, Cl. 514-54.000.

Mastboom, Johannes G. P., to U.S. Philips Corporation. Electrical lamp with a screw base formed by identical halves. 4,705,984, Cl. 313-318.000.

Mastronardo, Patrick, to Lebo Peerless, Inc. Multiple cassette storage tray. 4,705,169, Cl. 206-387.000.

Masuda, Masachika; and Murakami, Gen, to Hitachi, Ltd. Semiconductor device and method of producing the same. 4,706,105, Cl. 357-74.000.

Masuda, Senichi. RF high-voltage power supply. 4,706,182, Cl. 363-139.000.

Masugi, Takashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanada, Hideaki; and Kawabata, Kohji, 4,705,851, Cl. 540-215.000.

Masuoka, Fujio: *See*—
Nakagawa, Kaoru; Ogura, Mitsugi; Natori, Kenji; and Masuoka, Fujio, 4,706,249, Cl. 371-38.000.

Mathia, Thomas: *See*—
Longeray, Remi; Lanteri, Pierre; Mathia, Thomas; Jodelet, Francois; and Segura, Serge, 4,705,815, Cl. 521-160.000.

Matsuda, Hiroshi: *See*—
Eguchi, Ken; Nishimura, Yukuo; Haruta, Masahiro; Matsuda, Hiroshi; Hirai, Yutaka; and Nakagiri, Takashi, 4,705,403, Cl. 356-319.000.

Matsuda, Tatsuya; and Nakagawa, Akira. Hose coupler for spiral wire reinforced hoses. 4,705,304, Cl. 285-243.000.

Matsuda, Yoshio, to Yoshida Kogyo K.K. Bidirectionally stretchable support tape for hook-and-loop fasteners. 4,705,710, Cl. 428-92.000.

Matsumoto, Hisayoshi, to Citizen Watch Co., Ltd. Protection circuit for driver transistor of printer head. 4,705,412, Cl. 400-54.000.

Matsumoto, Masakatsu; and Nishimura, Yasunobu, to Sagami Chemical Research Center; and Central Glass Company, Limited. Fluorine-substituted phenyl benzoates and process for producing same. 4,705,884, Cl. 560-109.000.

Matsumoto, Minoru: *See*—
Sasage, Tsutomu; Matsumoto, Minoru; and Yoshikawa, Toru, 4,705,266, Cl. 271-264.000.

Matsumoto, Satoshi, to Research Development Corporation of Japan. Esterification and/or ester interchange catalyst. 4,705,764, Cl. 502-62.000.

Matsumoto, Susumu; Suzuki, Shigeru; Watanabe, Hisao; and Hanabe, Hiroshi, to Mitsubishi Chemical Industries Limited. Benzofuranyloxyphenylurea derivative and herbicidal composition containing it as an active ingredient. 4,705,554, Cl. 71-88.000.

Matsumoto, Yoshio; Fujii, Toshio; Shinohara, Yoshinao; and Fukuda, Kiyoshi, to Mitsubishi Chemical Industries Limited. Polypropylene resin composition and biaxially stretched film thereof. 4,705,828, Cl. 525-232.000.

Matsumura, Toshimi; Sumitani, Shinya; Hayakawa, Takahiro; Hasegawa, Takashi; and Sakakibara, Shuji, to Nippondenso Co., Ltd. Apparatus and method for controlling amount of fuel injected into engine cylinders. 4,705,000, Cl. 123-357.000.

Matsunaga, Hiroshi; Tokunaga, Ichiro; Shimojima, Yoji; and Obata, Kosei, to Alps Electric Co., Ltd. Optical switch. 4,705,348, Cl. 350-96.150.

Matsuno, Tomio: *See*—
Taniguchi, Fumio; and Matsuno, Tomio, 4,705,099, Cl. 165-12.000.

Matsuoka, Tsugufumi: *See*—
Nakashima, Yukio; Haku, Hisao; Watanabe, Kaneo; and Matsuoka, Tsugufumi, 4,705,912, Cl. 136-258.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Asada, Takafumi; Yoshida, Cyuryo; Shioyama, Tadao; and Kurose, Kazuyoshi, 4,706,143, Cl. 360-107.000.
Asada, Takafumi; Yoshida, Cyuryo; Shioyama, Tadao; and Hosokawa, Yoshiteru, 4,706,144, Cl. 360-107.000.
Masho, Yukio; Kakimi, Shigeru; Ueki, Toru; Miyauchi, Satoshi; Ohigashi, Tugio; and Kurohata, Hitoshi, 4,705,154, Cl. 194-319.000.
Nakano, Akihiko; Hibino, Takeshi; Takata, Hajime; and Yoshida, Manabu, 4,705,911, Cl. 136-251.000.
Soji, Kazuo; and Nagano, Hiroyuki, 4,705,999, Cl. 318-568.000.

Matsushita Electric Works Ltd.: *See*—
Sainomoto, Yoshinori; and Maekawa, Nobuteru, 4,706,153, Cl. 361-42.000.

Matsushita Electronics Corporation: *See*—
Iwama, Katsuaki; Takahashi, Mutsuo; and Shibata, Haruo, 4,705,986, Cl. 313-487.000.

Matsuura, Kazuo; Yoshioka, Hiroshi; and Koga, Kiyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Fluid-filled bushing. 4,705,263, Cl. 267-33.000.

Matsuura, Masataka: *See*—
Funada, Fumiaki; Kuwagaki, Hiroshi; Yamamoto, Kunihiko; and Matsuura, Masataka, 4,705,360, Cl. 350-344.000.

Matt H. Hohner AG: *See*—
Zacharias, Ernst, 4,704,938, Cl. 84-377.000.

Mattsson, Lennart P. J.: *See*—
Agoston, Andras; and Mattsson, Lennart P. J., 4,705,990, Cl. 315-39.550.

Maures, Michel; Pasdeloup, Jacques; and Lespinasse, Patrick, to Societe Nationale des Poudres et Explosifs. Process for the manufacture of

combustible articles by embossing combustible paper and combustible articles thus produced. 4,705,655, Cl. 264-3.400.
May, John E., to General Electric Company. Surface mount varistor. 4,706,060, Cl. 338-20.000.
Mayer, Dietmar: *See*—
Hammerschmidt, Erich; Behre, Horst; Blank, Heinz U.; and Mayer, Dietmar, 4,705,652, Cl. 260-512.00C.
Mayer, Klaus, to VDO Adolf Schindling AG. Display device. 4,704,984, Cl. 116-287.000.
Maytag Company, The: *See*—
Beach, Stanley H., 4,705,018, Cl. 126-39.00N.
Beach, Stanley H.; and Brangan, Richard W., 4,705,019, Cl. 126-39.00E.
Beach, Stanley H., 4,705,021, Cl. 126-41.00R.
Mazanec, Terry J.; Frye, John G., Jr.; and Hardman, Harley F., to Standard Oil Company, The. Alcohol compositions for blending with gasoline. 4,705,532, Cl. 44-53.000.
McCambridge, John M.: *See*—
Miesterfeld, Frederick O. R.; Fassnacht, Ronald E.; and McCambridge, John M., 4,706,082, Cl. 340-825.500.
McCandlish, Larry E.; and Ho, Teh C., to Exxon Research and Engineering Company. Hydroprocessing with self-promoted molybdenum and tungsten sulfide catalyst. 4,705,619, Cl. 208-112.000.
McCollum, Patrick E.: *See*—
Kinoshita, Roy Y.; McCollum, Patrick E.; and Colan, Mark E., 4,705,962, Cl. 307-247.100.
McComas, Charles C.; and Stewart, Dennis C., to United Technologies Corporation. Repair of surface defects in superalloy articles. 4,705,203, Cl. 228-119.000.
McCullough, Harold E., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Electrical relay apparatus. 4,706,056, Cl. 335-192.000.
McCurdy, John W.; and Danyliw, Brian H., to Calgon Corporation. Process to improve the removal of suspended solids in leached uranium ore clarification. 4,705,672, Cl. 423-3.000.
McDaniel, Harry C.: *See*—
Brand, Larry M.; and McDaniel, Harry C., 4,705,690, Cl. 426-590.000.
McDavid, Larry S.: *See*—
Beebe, Cedric H.; McDavid, Larry S.; and Pawlowski, Michael, 4,705,617, Cl. 204-402.000.
McDermott Incorporated: *See*—
Will, Stephen A., 4,705,430, Cl. 405-227.000.
McDonald, Mario: *See*—
Poirier, Clovis; Banville, Marcel; McDonald, Mario; McDonald, Sabin; Johnston, Stephen; and Masson, Jean-Rene, 4,704,815, Cl. 43-4.000.
McDonald, Sabin: *See*—
Poirier, Clovis; Banville, Marcel; McDonald, Mario; McDonald, Sabin; Johnston, Stephen; and Masson, Jean-Rene, 4,704,815, Cl. 43-4.000.
McDougal, John A. Impact structures. 4,704,943, Cl. 89-36.020.
McEntire, Edward E.; and Knifton, John F., to Texaco Inc. Preparation of disecondary amines from diolefins and primary amines. 4,705,898, Cl. 564-467.000.
McGovern, Douglas E.: *See*—
Tom, Edward; and McGovern, Douglas E., 4,706,069, Cl. 340-541.000.
McIntyre, Jonothon M. W. Fluid collection and disposal apparatus. 4,705,248, Cl. 248-99.000.
McKie, Robert T., to Morrison-Knudsen Company, Inc. High temperature gas flow meter. 4,704,904, Cl. 73-204.000.
McLendon, Thomas R.: *See*—
Little, William E.; and McLendon, Thomas R., 4,705,108, Cl. 166-248.000.
McMichael, John. Methods and materials for treatment of disease states involving immunological factors. 4,705,685, Cl. 424-89.000.
McMullen, Dillon G.: *See*—
McMullen, Roger B.; McMullen, Dillon G.; and McMullen, Frederick G., 4,705,603, Cl. 202-109.000.
McMullen, Frederick G.: *See*—
McMullen, Roger B.; McMullen, Dillon G.; and McMullen, Frederick G., 4,705,603, Cl. 202-109.000.
McMullen, Roger B.; McMullen, Dillon G.; and McMullen, Frederick G. Pyrolytic apparatus. 4,705,603, Cl. 202-109.000.
McNeely, Michael D.; and Powell, Walter W., to Anderson, Greenwood & Company. Safety relief system for control or vent valves. 4,705,065, Cl. 137-484.600.
McNeilab, Inc.: *See*—
Goss, Jack, 4,705,498, Cl. 604-6.000.
McNeilus, Garwin B.: *See*—
Christenson, Ronald E.; and McNeilus, Garwin B., 4,705,133, Cl. 180-209.000.
McNeilus Truck and Manufacturing, Inc.: *See*—
Christenson, Ronald E.; and McNeilus, Garwin B., 4,705,133, Cl. 180-209.000.
McNulty, Robert F., Jr.: *See*—
Forti, Steven A.; and McNulty, Robert F., Jr., 4,706,070, Cl. 340-508.000.
McVay, David M.: *See*—
Allen, James D.; and McVay, David M., 4,706,032, Cl. 328-1.000.
Mead Corporation, The: *See*—
Feliks, James J.; Culpepper, Will L.; and Scott, Dale K., 4,705,159, Cl. 198-468.800.
Meadows, Bernard A. Method and apparatus for effecting an opening in a well casing. 4,705,112, Cl. 166-285.000.
Measurex Corporation: *See*—
Chase, Lee M.; and Sudikoff, David, 4,706,267, Cl. 378-61.000.
Mecron medizinische Produkte GmbH: *See*—
Ahrens, Uwe, 4,705,520, Cl. 623-23.000.
Medi-Tech, Incorporated: *See*—
Mueller, Peter R.; Brown, Alan S.; Tolkoff, Marc J.; and Crawford, Frank B., 4,705,040, Cl. 128-334.00R.
Medica Corporation: *See*—
Kaltenbach, Karl W.; Rettew, Stephen; Rudy, John O.; and Szakacs, Gabor L., 4,705,668, Cl. 422-82.000.
Medosan Industrie Biochimiche Riunite S.p.A.: *See*—
Baglioni, Alessandro, 4,705,873, Cl. 549-494.000.
MEGA/ERG Inc.: *See*—
Lerner, Lawrence; and Diskin, Stephen P., 4,705,484, Cl. 439-502.000.
Mehrgardt, Soenke, to Deutsche ITT Industries GmbH. Frequency synthesizer circuit. 4,706,040, Cl. 331-1.00A.
Meier, Daniel A.; and Groshans, Michael J., to Nalco Chemical Company. Method of preventing corrosion of uncoated aluminum sheet or beverage cans in a brewery pasteurizer water system. 4,705,703, Cl. 427-239.000.
Meijer, Egbert W.: *See*—
Hummelen, Jan C.; Meijer, Egbert W.; and Wynberg, Hans, 4,705,847, Cl. 530-350.000.
Meijer, John; Westmijze, Hans; and Boelema, Eltjo, to Akzo NV. t-Alkenyl peroxy esters. 4,705,888, Cl. 560-302.000.
Meister, Klaus: *See*—
Meyers, Pierre; and Meister, Klaus, 4,706,084, Cl. 340-825.310.
Melby, Phillip J. Body stimulating mechanical jogger. 4,705,028, Cl. 128-25.00B.
Melbye, Hartvig E., to Storage Technology Partners 11. Differential track recording. 4,706,235, Cl. 369-46.000.
Melle, Antonio: *See*—
Astegiano, Luciano; Bertoglio, Ottavio; Bosco, Fulvio; de Bosio, Alfredo; Franco, Dario; Lampiano, Piero; Melle, Antonio; and Rosboch, Luciano, 4,706,270, Cl. 379-2.000.
Mellet, Robert. Process and apparatus for obtaining a gaseous stream containing a compound in the vapor state, more particularly usable for introducing this compound into an epitaxy reactor. 4,704,988, Cl. 118-726.000.
Meloy, Thomas P. Apparatus for analysis of particulate material. 4,704,911, Cl. 73-865.500.
Melton, Florence. Portable exercise device. 4,705,270, Cl. 272-93.000.
Menchetti, Robert J.; and Chapman, Robert M., to National Gypsum Company. Wall construction. 4,704,837, Cl. 52-631.000.
Mendelson, Leah T.: *See*—
Goldblatt, Irwin L.; and Mendelson, Leah T., 4,705,641, Cl. 252-35.000.
Mendoza, Abel, to Dow Chemical Company, The. Brominated hydroxyaromatic compounds. 4,705,901, Cl. 568-729.000.
Mentor O & O, Inc.: *See*—
Reimels, Harry G.; Walsh, David A.; and Arsenault, Michael J., 4,705,500, Cl. 604-35.000.
Mercer, Larry N., to Unisys Corporation. Switching converter with enhanced voltage clamping and energy recovery. 4,706,181, Cl. 363-133.000.
Merck & Co., Inc.: *See*—
Boger, Joshua S.; and Payne, Linda S., 4,705,892, Cl. 562-562.000.
Merkle Engineers, Inc.: *See*—
Coates, Stephen J., 4,705,475, Cl. 432-238.000.
Merritt, John E.: *See*—
Avila, Louis J.; Merritt, John E.; and Hempling, Norman G., 4,706,047, Cl. 332-19.000.
Mesa, Onelio. Back scrubbing device. 4,704,759, Cl. 15-160.000.
Messer Griesheim GmbH: *See*—
Theissen, Friedel; and Fieseler, Heinrich, 4,705,189, Cl. 220-465.000.
Metelko, Rudy R., Jr. Ash disposal device. 4,704,764, Cl. 15-301.000.
Metropolitan Stevedore Company: *See*—
Dudley, Jerry W.; and Andrich, Patrick J., 4,705,140, Cl. 182-3.000.
Metz, Arthur J.: *See*—
Ainsworth, Walter W.; and Metz, Arthur J., 4,705,961, Cl. 307-228.000.
Metzger, Karl G.: *See*—
Schriewer, Michael; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,705,788, Cl. 514-254.000.
Meurice, Pierre: *See*—
Lecerf, Jean-Pierre; Favey, Charles; and Meurice, Pierre, 4,705,059, Cl. 137-82.000.
Meyer, Horst: *See*—
Wehinger, Egbert; Meyer, Horst; and Benz, Ulrich, 4,705,794, Cl. 514-302.000.
Meyers, Pierre; and Meister, Klaus. Coded key-type locking system. 4,706,084, Cl. 340-825.310.
MG Industries, Inc.: *See*—
Burckhardt, Klaus A.; and Brodbeck, Howard D., 4,705,574, Cl. 134-17.000.
Michaud, Mark: *See*—
Zobbi, Robert G.; and Michaud, Mark, 4,705,594, Cl. 156-637.000.
Michiguchi, Yoshihiro; Takahashi, Fuminobu; Hiramoto, Kazuo; Nishi, Masatsugu; and Sonoda, Shinji, to Hitachi, Ltd. Method and system for detecting an object with a radio wave. 4,706,031, Cl. 324-337.000.
Microdot Inc.: *See*—
Repella, James A., 4,705,277, Cl. 277-134.000.

Midland, Richard W.; and Rozansky, Boris, to Zenith Electronics Corporation. Wide band beam index system with improved brightness. 4,706,116, Cl. 358-67.000.

Midorikawa, Shoichi: *See*—
Isayama, Muneo; and Midorikawa, Shoichi, 4,705,221, Cl. 241-27.000.

Midorikawa, Yoshiaki: *See*—
Shimada, Masaaki; Saito, Koji; and Midorikawa, Yoshiaki, 4,705,702, Cl. 427-180.000.

Miesterfeld, Frederick O. R.; Fassnacht, Ronald E.; and McCambridge, John M., to Chrysler Motors Corporation. Serial data bus for intermodule data communications. 4,706,082, Cl. 340-825.500.

Mignani, Gerard; and Morel, Didier, to Rhone-Poulenc Sante. Process for the preparation of compounds halogenated α to an electron-attracting group. 4,705,650, Cl. 260-405.500.

Mihayashi, Keiji; and Takada, Shunji, to Fuji Photo Film Co. Ltd. Silver halide color photographic light-sensitive material. 4,705,743, Cl. 430-385.000.

Mikami, Tsutomu: *See*—
Oba, Seisuke; Mikami, Tsutomu; Suzuki, Hideyuki; Shimada, Mitsuhiro; and Suzuki, Tadashi, 4,706,141, Cl. 360-96.500.

Milanese, Alberto: *See*—
Desideri, Derio; Stradi, Riccardo; and Milanese, Alberto, 4,705,855, Cl. 544-370.000.

Milano, Robert: *See*—
Sahm, Michael K.; and Milano, Robert, 4,705,455, Cl. 416-97.00R.

Mileikowsky, Curt. Radiation therapy for cancer patients. 4,705,955, Cl. 250-492.100.

Miller Brewing Company: *See*—
Rahn, Eckhard F., 4,705,188, Cl. 220-367.000.

Miller, Charles E.; Poland, Robert L.; and Yoshida, Louis T., to Engineering Measurements Co. Method and apparatus for managing steam systems. 4,705,212, Cl. 236-54.000.

Miller, James A.: *See*—
Evert, Robert P.; and Miller, James A., 4,704,886, Cl. 72-57.000.

Miller, Michael J., to GTE Products Corporation. Method for producing fine cobalt metal powder. 4,705,559, Cl. 75-0.5AA.

Miller, Richard J. Hoisting and dumping container. 4,705,446, Cl. 414-422.000.

Millerd, Donald L.; and Bell, Marl J., to Steven Alpert, a part interest. Automatic window wiper control. 4,705,998, Cl. 318-444.000.

Millet, Claude; and Rostaing, Paul, to Rhone-Poulenc Chimie. Blowing agent admixture for foamable organopolysiloxane compositions. 4,705,810, Cl. 521-86.000.

Milstead, Leon R.; Lowe, Laban R.; Schnepfe, Robert W., Jr.; and Erickson, Merlin L., to AAI Corporation. Method of assembly of compacted particulates and explosive charge. 4,704,967, Cl. 102-334.000.

Minami, Hiroo; and Asahi, Sadsho, to Yoshida Kogyo K.K. Pull tab for slide fastener. 4,704,770, Cl. 24-431.000.

Minami, Keijirou: *See*—
Nishiguchi, Yasuo; Minami, Keijirou; and Hoda, Masakazu, 4,705,697, Cl. 427-36.000.

Minemura, Kouichi; Shikada, Minoru; and Emura, Katsumi, to NEC Corporation. Optical heterodyne detection pulse receiving system and method. 4,706,300, Cl. 455-619.000.

Minigrip, Inc.: *See*—
Ausnit, Steven, 4,706,297, Cl. 383-63.000.
Boeckmann, Hugo; and Van Erden, Donald L., 4,704,842, Cl. 53-450.000.

Minks, Floyd M. Regulated power supply for a solid state ignition system. 4,705,013, Cl. 123-598.000.

Minnesota Mining and Manufacturing Company: *See*—
Abrahamson, Gerald R.; and Duwell, Ernest J., 4,705,124, Cl. 175-410.000.
Archibald, G. Kent, 4,705,506, Cl. 604-81.000.
Balestra, Luciano, 4,705,738, Cl. 430-264.000.
Buckanin, Richard S., 4,705,840, Cl. 528-53.000.
Buckingham, John S., 4,706,161, Cl. 361-220.000.
Burguette, Mario D.; and Foss, George D., 4,705,699, Cl. 427-54.100.
Fisch, Richard S., 4,705,739, Cl. 430-276.000.
Kitchin, Jonathan P.; Powers, Stephen R.; Penfound, Keith A.; Finn, Peter J.; and Fisher, Michael G., 4,705,745, Cl. 430-505.000.
Knowd, Michael J., 4,706,282, Cl. 380-3.000.
Knowd, Michael J., 4,706,293, Cl. 381-31.000.
Notley, Norman T., 4,705,736, Cl. 430-138.000.

Minolta Camera Kabushiki Kaisha: *See*—
Ito, Masazumi, 4,705,393, Cl. 355-14.0SH.
Mukai, Hiromu; Yamaki, Toshio; Fujino, Akihiko; Izumi, Shuji; Nakai, Masaaki; and Taniguchi, Nobuyuki, 4,705,382, Cl. 354-412.000.

Mirowski, Mieczslaw: *See*—
Imran, Mir, 4,705,043, Cl. 128-419.0PG.

Mishima, Junichi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument producing level-controlled rhythmic tones. 4,704,932, Cl. 84-1.030.

Mishiro, Shoji, to Taga Electric Co., Ltd. Drive control method of ultrasonic vibrator. 4,705,980, Cl. 310-323.000.

Mistry, Kishor K.: *See*—
Symes, Kenneth C.; Langley, John; and Mistry, Kishor K., 4,705,825, Cl. 524-732.000.

Misumi, Teruo: *See*—
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,705,730, Cl. 430-57.000.
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,705,731, Cl. 430-57.000.
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Mita, Hideo; and Kurazono, Shuichi, to Aisin Seiki Kabushiki Kaisha. Radiator device. 4,705,097, Cl. 165-4.000.

Mitamura, Katsuaki: *See*—
Suga, Shigeru; Chaki, Kiyoshi; Natori, Etsuji; Suga, Shigeo; and Mitamura, Katsuaki, 4,704,903, Cl. 73-159.000.

Mitchell, David C. Substituted fructose compounds and vitamin supplements and methods for making same. 4,705,875, Cl. 556-46.000.

Mitra, Abhijit: *See*—
Nichols, Richard W.; Zabrodski, William J.; and Mitra, Abhijit, 4,705,902, Cl. 568-810.000.

Mitra, Gayatri; and Mitra, Grihapati. Vegetable food pattie composition and process. 4,705,693, Cl. 426-629.000.

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Mitra, Gayatri; and Mitra, Grihapati, 4,705,693, Cl. 426-629.000.

Mitsch, James M.: *See*—
Hampton, Thomas G.; Mitsch, James M.; Palmieri, Joseph M.; Parker, David S.; and DeRosier, Donna C., 4,706,054, Cl. 335-203.000.

Mitsuba Electric Manufacturing Co., Ltd.: *See*—
Shibata, Takashi; Yamada, Nobuo; Mada, Yoshikazu; and Iizima, Masaki, 4,705,977, Cl. 310-235.000.

Mitsubishi Chemical Industries Limited: *See*—
Matsumoto, Susumu; Suzuki, Shigeru; Watanabe, Hisao; and Hanabe, Hiroshi, 4,705,554, Cl. 71-88.000.
Matsumoto, Yoshio; Fujii, Toshio; Shinohara, Yoshinao; and Fukuda, Kiyoshi, 4,705,828, Cl. 525-232.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Asayama, Yoshiaki, 4,705,009, Cl. 123-571.000.
Hattori, Shinichi, 4,706,204, Cl. 364-513.000.
Hayashi, Shigeo, 4,706,178, Cl. 363-98.000.
Hirota, Jitsuho; Machida, Kazumichi; and Watanabe, Noriko, 4,705,204, Cl. 228-179.000.
Ito, Hiroshi; and Mizutani, Yoshiki, 4,706,113, Cl. 358-37.000.
Kanamori, Osamu, 4,705,155, Cl. 198-335.000.
Kassai, Yoshio, 4,706,214, Cl. 364-900.000.
Kojima, Kenji, 4,706,034, Cl. 328-151.000.
Mori, Shunji; Tajima, Shinobu; and Itoh, Atsushi, 4,705,451, Cl. 414-70.000.
Shiba, Tetsuo; Takahashi, Kazuhisa; Ikeda, Kenji; and Higuchi, Hideyo, 4,706,106, Cl. 357-78.000.
Shimazu, Yukihiko, 4,706,157, Cl. 361-86.000.
Suda, Kakutaro; and Hirao, Tadashi, 4,705,599, Cl. 156-653.000.
Taki, Youichirou, 4,705,968, Cl. 307-456.000.
Yabe, Kiyoshi; and Onuma, Akiyoshi, 4,705,144, Cl. 185-40.00R.
Yoda, Kiyoshi; Itagaki, Hidenobu; and Fujimura, Satoshi, 4,706,028, Cl. 324-309.000.
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Mitsubishi Gas Chem. Company, Inc.: *See*—
Niwa, Kensuke; Fujita, Hisayoshi; Saito, Yoshihiko; Makihara, Hiroshi; Hashimoto, Ritsuo; Hoshi, Younosuke; and Murayama, Katsutoshi, 4,705,654, Cl. 261-128.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Danno, Yoshiaki; Takahashi, Akira; and Iida, Kazumasa, 4,705,001, Cl. 123-417.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Niwa, Kensuke; Fujita, Hisayoshi; Saito, Yoshihiko; Makihara, Hiroshi; Hashimoto, Ritsuo; Hoshi, Younosuke; and Murayama, Katsutoshi, 4,705,654, Cl. 261-128.000.

Mitsubishi Mining & Cement Co., Ltd.: *See*—
Uetsuhara, Tokio, 4,706,055, Cl. 335-229.000.

Mitsubishi Petrochemical: *See*—
Fujii, Tadashi; Yagami, Hiroyuki; Seo, Iwao; and Sasaki, Masahiro, 4,704,774, Cl. 29-25.350.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Yamaguchi, Shoji; and Yamada, Kimiko, 4,705,647, Cl. 252-512.000.

Mitsui Engineering and Shipbuilding Co. Ltd.: *See*—
Endo, Yasuhisa; Mizuhara, Shuhei; Murakami, Satoshi; Beppu, Osamu; and Toshioka, Saiji, 4,704,997, Cl. 123-198.0DB.

Mitsui Toatsu Chemicals, Inc.: *See*—
Ito, Keiko; Ito, Michiyasu; Tsuji, Shoichi; and Suzuki, Hisatosi, 4,705,812, Cl. 521-92.000.
Ito, Keiko; Ito, Michiyasu; Tsuji, Shoichi; Suzuki, Hisatosi; and Ito, Shoichi, 4,705,813, Cl. 521-92.000.
Kawai, Yoichi; Abe, Masaru; Yoshihara, Akio; Hayashi, Shigeru; and Sekiguchi, Katsumi, 4,705,818, Cl. 523-200.000.

Miura, Kazuhiko: *See*—
Ohta, Minoru; Miura, Kazuhiko; Onoda, Michitoshi; Iwasaki, Yukio; and Hattori, Tadashi, 4,705,713, Cl. 428-209.000.

Miwa, Kishio; Kihara, Makoto; Sakaya, Kazuyuki; and Inoue, Takehisa, to Toray Industries, Inc. Absorption apparatus including rotary valve. 4,705,627, Cl. 210-264.000.

Miwa, Tadashi: *See*—
Hirota, Fumiyuki; Miwa, Tadashi; and Yamada, Yasushi, 4,705,265, Cl. 271-122.000.

Miyagawa, Toshihito: *See*—
Yamada, Yukifumi; Terada, Takami; and Miyagawa, Toshihito, 4,705,318, Cl. 297-362.000.

Miyagishi, Akira: *See*—
Yamamoto, Michihiro; Ozato, Yukinori; Tamura, Nobuhiko; Miyagishi, Akira; and Hara, Youichi, 4,705,786, Cl. 514-252.000.

Miyaoka, Kazuyoshi; Kobayashi, Kazuhiro; Kuse, Satoru; Kurematsu, Masayuki; and Koboshi, Shigeharu, to Konishiroku Photo Ind. Co., Ltd. Automatic processing machine for photography. 4,705,378, Cl. 354-324.000.

Miyaoka, Kazuyoshi: *See*—
Kobayashi, Kazuhiro; Koboshi, Shigeharu; Kuse, Satoru; Miyaoka, Kazuyoshi; and Kurematsu, Masayuki, 4,705,377, Cl. 354-322.000.
Kobayashi, Kazuhiro; Koboshi, Shigeharu; Kuse, Satoru; Miyaoka, Kazuyoshi; Kurematsu, Masayuki; and Uchida, Makoto, 4,705,379, Cl. 354-324.000.

Miyasaka, Masao: *See*—
Nishimura, Hiroshi; and Miyasaka, Masao, 4,704,963, Cl. 101-425.000.

Miyata, Shinobu; and Kinouchi, Takashige, to NEC Corporation. Word length selectable memory. 4,706,219, Cl. 365-189.000.

Miyauchi, Satoshi: *See*—
Masho, Yukio; Kakimi, Shigeru; Ueki, Toru; Miyauchi, Satoshi; Ohigashi, Tugio; and Kurohata, Hitoshi, 4,705,154, Cl. 194-319.000.

Miyauchi, Yujiro: *See*—
Shindou, Yoshio; Oka, Joji; Taira, Taketoshi; Miyauchi, Yujiro; and Yamazaki, Fumio, 4,705,726, Cl. 428-562.000.

Miyawaki, Mamoru, to Canon Kabushiki Kaisha. Thin film type optical device. 4,705,346, Cl. 350-96.140.

Miyazaki, Masaru; and Kohata, Toshihide, to Japan Tobacco, Inc. Automatic wrapping material change-over apparatus. 4,705,225, Cl. 242-56.00R.

Miyazawa, Seiichi: *See*—
Nojiri, Hidetoshi; Miyazawa, Seiichi; Hakamada, Isao; and Hajimoto, Yoshioki, 4,706,254, Cl. 372-46.000.

Mizoguchi, Toshiaki: *See*—
Mizukami, Hidetada; Urata, Tsutomu; Nakagawa, Takashi; Hashimoto, Kunihiro; and Mizoguchi, Toshiaki, 4,705,279, Cl. 279-1.00L.

Mizuhara, Shuhei: *See*—
Endo, Yasuhisa; Mizuhara, Shuhei; Murakami, Satoshi; Beppu, Osamu; and Toshioka, Saiji, 4,704,997, Cl. 123-198.0DB.

Mizukami, Hidetada; Urata, Tsutomu; Nakagawa, Takashi; Hashimoto, Kunihiro; and Mizoguchi, Toshiaki, to Ye Data Inc. Device for clamping a flexible disk. 4,705,279, Cl. 279-1.00L.

Mizusawa, Akira, to Nifco Inc. Device for holding automobile fuel-tank filler port cap. 4,705,190, Cl. 220-375.000.

Mizutani, Morikazu; Onoda, Shigeyoshi; and Kanemitsu, Shinji, to Canon Kabushiki Kaisha. Image forming apparatus with locking means. 4,705,384, Cl. 355-3.00R.

Mizutani, Yoshiki: *See*—
Ito, Hiroshi; and Mizutani, Yoshiki, 4,706,113, Cl. 358-37.000.

Mobil Oil Corporation: *See*—
Cheruvu, Subrahmanyam, 4,705,623, Cl. 209-161.000.
Kwack, Tae H.; and Su, Tien-Kuei, 4,705,829, Cl. 525-240.000.
Penick, Joe E., 4,705,621, Cl. 208-146.000.
Shah, Ashwin N.; and DeMay, Roland, 4,705,471, Cl. 425-195.000.
Yan, Tsoung Y., 4,705,534, Cl. 44-57.000.
Yan, Tsoung-Y, 4,705,909, Cl. 585-828.000.

Modin, Jimmie D. Hairstyling brush and a method for handling hairstyling brushes. 4,705,052, Cl. 132-85.000.

Moeller, Hinrich; and Zeidler, Ulrich, to Henkel Kommanditgesellschaft auf Aktien. Oligopeptide derivatives, their production and their use as surfactants gentle to the skin. 4,705,682, Cl. 424-70.000.

Moffett, Darcel R., to Judy's Walking Beam Service, Inc. Apparatus for replacing a trunnion bracket spindle. 4,704,780, Cl. 29-252.000.

Mogi, Takao; and Morizono, Masahiko, to Sony Corporation. Integrated circuit devices. 4,706,186, Cl. 364-136.000.

Mohammadian, Mehdi: *See*—
Brubakken, Gardner G.; and Mohammadian, Mehdi, 4,704,747, Cl. 4-321.000.

Mohr, Karl-Heinz; and Tratz, Manfred, to Balcke-Durr Aktiengesellschaft. Cleaning device for regenerative heat exchangers. 4,705,057, Cl. 134-180.000.

Moisson, Marc F.: *See*—
Shen, Nelson M.; Moisson, Marc F.; Arrington, John P.; and Tayeb, AbdulMohamed, 4,705,347, Cl. 350-96.150.

Mold-Masters Limited: *See*—
Schmidt, Harald H., 4,705,473, Cl. 425-549.000.

Mollenhoff, David V. Drip coffee maker. 4,704,954, Cl. 99-279.000.

Moloney, John J., to Continental White Cap, Inc. Corrosion resistant closure construction. 4,705,183, Cl. 215-276.000.

Monch, Hans: *See*—
Sacks, Dieter; and Monch, Hans, 4,704,763, Cl. 15-262.000.

Mondloch, Michael J.; and Skover, Nick, Jr., to Applied Power Inc. Exercise apparatus. 4,705,271, Cl. 272-130.000.

Monico, Dominick L.: *See*—
Van Malderghem, Edmund G.; Monico, Dominick L.; and Anderson, Michael W., 4,705,298, Cl. 282-11.50A.

Montgomery, Ronald S. Pipe repair clamp. 4,705,078, Cl. 138-99.000.

Moore Business Forms, Inc.: *See*—
Van Malderghem, Edmund G.; Monico, Dominick L.; and Anderson, Michael W., 4,705,298, Cl. 282-11.50A.
Wakeman, William R., 4,705,297, Cl. 281-2.000.

Moore, James G., to F.R.P. Industires, Inc. Livestock watering system. 4,704,991, Cl. 119-73.000.

Moore, John, to British Petroleum Company p.l.c., The. Tool loading device. 4,705,314, Cl. 294-115.000.

Moore Special Tool Co., Inc.: *See*—
Moore, Wayne R., 4,704,825, Cl. 51-290.000.

Moore, Wayne R., to Moore Special Tool Co., Inc. Method for automatically sizing a ground surface on a workpiece. 4,704,825, Cl. 51-290.000.

Morehouse, Charles C.: *See*—
Birk, John; Breu, Heinz; Gong, William; Morehouse, Charles C.; and Liebes, Sidney, Jr., 4,705,081, Cl. 140-147.000.

Morel, Didier: *See*—
Mignani, Gerard; and Morel, Didier, 4,705,650, Cl. 260-405.500.

Morelli, Aldo. Magnetic oil filter module. 4,705,626, Cl. 210-130.000.

Morgan, Dan R.: *See*—
Kupper, Philip L.; and Morgan, Dan R., 4,705,691, Cl. 426-590.000.

Morgan, Robert L.: *See*—
Geer, Ralph D.; Morgan, Robert L.; and Senek, Dexter S., 4,705,260, Cl. 266-78.000.

Mori, Shunji; Tajima, Shinobu; and Itoh, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Robot control apparatus. 4,705,451, Cl. 414-70.000.

Mori, Toshimichi: *See*—
Shitaokoshi, Sachiro; Sekiguchi, Mamoru; Takagi, Toshiaki; and Mori, Toshimichi, 4,705,497, Cl. 604-4.000.

Morikawa, Koji, to Fuji Jukogyo Kabushiki Kaisha. System for controlling the intake air of an automotive engine. 4,704,996, Cl. 123-188.00M.

Morita, Akitaka: *See*—
Hashimoto, Shintaro; Morita, Akitaka; and Tsuda, Hiroshi, 4,706,288, Cl. 381-51.000.

Morita, Akiyoshi: *See*—
Hattori, Hiroyuki; and Morita, Akiyoshi, 4,706,075, Cl. 340-726.000.

Morita, Tsuneharu; Ikeyama, Toshiharu; Iwaki, Osamu; and Katsuta, Hisao, to Kobayashi Bansokiki Co., Ltd. Apparatus for exchanging metal molds. 4,705,445, Cl. 414-280.000.

Morizono, Masahiko: *See*—
Mogi, Takao; and Morizono, Masahiko, 4,706,186, Cl. 364-136.000.

Morner, Bengt O. J. S.: *See*—
Andersson, Sture R.; Haland, Lars Y.; and Morner, Bengt O. J. S., 4,705,296, Cl. 280-806.000.

Morris, Gregory J. E., to Dow Chemical Company, The. Cell with improved electrolyte flow distributor. 4,705,614, Cl. 204-257.000.

Morris, James B. N.: *See*—
Chelette, K. Darrel, 4,705,307, Cl. 285-332.300.

Morrison-Knudsen Company, Inc.: *See*—
McKie, Robert T., 4,704,904, Cl. 73-204.000.

Morton, Douglas R., Jr. Prostacyclin analogs. 4,705,806, Cl. 514-530.000.

Morvai, Margit: *See*—
Madi-Szabo, Laszlo ; Morvai, Margit; Horvath nee Feher, Eva; Jansco, Sandor; Tamasi, Piroska; Kovacs, Istvan; Kiss nee Loss, Ilona Maria; Bacsa, Gyorgy; Kubala nee Papp, Maria; and Bene nee Horvath, Magdolna, 4,705,779, Cl. 514-27.000.

Mosher, Deane F., to Wisconsin Alumni Research Foundation. Process for preparation of multimeric plasma fibronectin. 4,705,751, Cl. 435-68.000.

Motorola, Inc.: *See*—
Bernstein, Jonathan J.; Koger, T. Bruce; and Chanley, Charles S., 4,705,659, Cl. 264-29.600.
Dydyk, Michael, 4,706,049, Cl. 333-110.000.
Groth, Edward J., Jr., 4,706,093, Cl. 342-427.000.
Navidi, Salar; Trout, Brent L.; and Wernett, Fred C., 4,706,038, Cl. 330-271.000.
Rebeschini, Michael E., 4,706,036, Cl. 330-253.000.
Sodd, Lal C., 4,706,218, Cl. 365-189.000.

Motte, Shunichi: *See*—
Yamazaki, Tsuneo; Motte, Shunichi; and Shimbo, Masafumi, 4,705,358, Cl. 350-334.000.

Mowill, R. Jan, to A/S Kongsberg Vapenfabrikk. Apparatus for mounting, and for maintaining running clearance in, a double entry radial compressor. 4,704,861, Cl. 60-39.320.

Moxham, Wayne R. Cultivating molluscs. 4,704,990, Cl. 119-4.000.

Moye, Lawrence D.: *See*—
Schmiedel, James P.; and Moye, Lawrence D., 4,705,341, Cl. 439-544.000.

Muan, Arnulf: *See*—
Najjar, Mitri S.; Becker, Michael W.; and Muan, Arnulf, 4,705,539, Cl. 48-197.00R.

Mucke, Bruno: *See*—
Klotzer, Sieghart; Mucke, Bruno; Mahlberg, Gunther; and Becker, Manfred, 4,705,747, Cl. 430-550.000.

Mueller, Allan H.; and Perkins, Dean P., to Geosource Inc. Reaction mass acceleration feedback device. 4,706,231, Cl. 367-190.000.

Mueller, Fritz; and Pienta, Lothar. Drive mechanism for a valve. 4,705,061, Cl. 137-269.000.

Mueller, Peter R.; Brown, Alan S.; Tolkoff, Marc J.; and Crawford, Frank B., to Medi-Tech, Incorporated. Percutaneous fixation of hollow organs. 4,705,040, Cl. 128-334.00R.

Muhich, John S.; and Thornley, Joseph S., to International Business Machines Corporation. Cursor circuit for a dual port memory. 4,706,074, Cl. 340-709.000.

Mukai, Hiromu; Yamaki, Toshio; Fujino, Akihiko; Izumi, Shuji; Nakai, Masaaki; and Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Flash photographing apparatus. 4,705,382, Cl. 354-412.000.

Mulholland, John H.: *See*—
Foster, John D., 4,704,949, Cl. 92-160.000.

Mullen, George B.: *See*—
Georgiev, Vassil S.; and Mullen, George B., 4,705,891, Cl. 562-491.000.

Muller, Hans. Cassette for cleaning the heads of a magnetic tape recorder. 4,706,147, Cl. 360-128.000.

Muller, Hans-Martin: *See*—
Plapp, Gunther; Zichner, Botho; Jautelat, Rudiger; Kohler, Rolf; Kratt, Alfred; and Muller, Hans-Martin, 4,705,007, Cl. 123-519.000.

Muller, Johannes C. A., to U.S. Philips Corporation. Magnetic tape threading apparatus. 4,706,140, Cl. 360-85.000.

Muller, Karl-Hans; Neumuller, Matthias; and Turk, Gunther, to Degussa Aktiengesellschaft. Transparent dental care composition. 4,705,679, Cl. 424-52.000.

Mullis, Kary B.: *See*—
Levenson, Corey H.; and Mullis, Kary B., 4,705,886, Cl. 560-159.000.

Mungons, Edwin M. Carrier for three wheeled vehicles. 4,705,448, Cl. 414-462.000.

Murakami, Gen: *See*—
Masuda, Masachika; and Murakami, Gen, 4,706,105, Cl. 357-74.000.

Murakami, Satoshi: *See*—
Endo, Yasuhisa; Mizuhara, Shuhei; Murakami, Satoshi; Beppu, Osamu; and Toshioka, Saiji, 4,704,997, Cl. 123-198.0DB.

Muramatsu, Toshihiko; Isomura, Shigenori; and Harada, Takashi, to Nippondenso Co., Ltd. Apparatus and method for injecting fuel into engine according to group injection system. 4,706,196, Cl. 364-431.050.

Murata, Kouji: *See*—
Honkura, Yoshinobu; Murata, Kouji; and Yokoyama, Takashi, 4,705,581, Cl. 148-307.000.

Murata Manufacturing Co., Ltd.: *See*—
Hattori, Jun; and Ishikawa, Youhei, 4,706,052, Cl. 333-219.000.
Inoue, Jiro; and Kota, Masaharu, 4,705,981, Cl. 310-324.000.

Murayama, Katsutoshi: *See*—
Niwa, Kensuke; Fujita, Hisayoshi; Saito, Yoshihiko; Makihara, Hiroshi; Hashimoto, Ritsuo; Hoshi, Younosuke; and Murayama, Katsutoshi, 4,705,654, Cl. 261-128.000.

Murayama, Yo: *See*—
Yamada, Koji; Hashimoto, Tamotsu; Naruse, Masao; Murayama, Yo; and Ninno, Hideki, 4,705,805, Cl. 514-548.000.

Muroya, Minoru: *See*—
Kawanabe, Tomohiko; Asakura, Masahiko; Kushida, Noritaka; Shiina, Takanori; and Muroya, Minoru, 4,705,012, Cl. 123-589.000.

Murphy, Michael; and Belszek, Henry, to National Icee Corporation. Modular booth structure. 4,704,827, Cl. 52-34.000.

Murray, Bruce, to U.S. Philips Corporation. Television transmission system. 4,706,109, Cl. 358-12.000.

Mustikka, Lauri A.: *See*—
Honkaniemi, Matti E.; Mustikka, Lauri A.; Jankkila, Martti J.; Hokkanen, Pentti O.; Heikkila , Risto M.; and Lilja, Launo L., 4,705,474, Cl. 432-14.000.

Mutzabaugh, Dennis M.: *See*—
Citta, Richard W.; Mutzabaugh, Dennis M.; and Sgrignoli, Gary J., 4,706,283, Cl. 380-12.000.
Citta, Richard W.; Mutzabaugh, Dennis M.; and Sgrignoli, Gary J., 4,706,284, Cl. 380-12.000.

Myers, H. Allen, to Sundstrand Corporation. Automatic travel speed control for a harvesting machine. 4,704,866, Cl. 60-449.000.

Myers, Janice L. Neck and face shield especially adapted to be worn under a hair dryer. 4,704,744, Cl. 2-174.000.

Myers, Martin G.; and Barrett, William A., to Allied Corporation. Method for manufacturing a center electrode for a spark plug. 4,705,486, Cl. 445-17.000.

Nada, Takatoshi: *See*—
Inoue, Takeshi; and Nada, Takatoshi, 4,706,230, Cl. 367-174.000.

Nadeau, Richard P., to Zorcom Enterprise, Inc. Toy exercizing machine for children. 4,705,268, Cl. 272-72.000.

Nagai, Yohei; and Isozaki, Yoshimasa, to Nippon Gakki Seizo Kabushiki Kaisha. Acoustic tone inhibiting means for keyboard musical instrumens. 4,704,931, Cl. 84-1.010.

Nagano, Hiroyuki: *See*—
Soji, Kazuo; and Nagano, Hiroyuki, 4,705,999, Cl. 318-568.000.

Nagasaka, Nagahiko, to Kabushiki Kaisha Yaskawa Denki Seisakusho. Linear resolver. 4,705,971, Cl. 310-12.000.

Nagasaka, Nagahiko, to Kabushiki Kaisha Yaskawa Denki Seisakusho. Surface pulse motor. 4,706,007, Cl. 318-687.000.

Nagata, Koichi: *See*—
Nishimura, Izumi; and Nagata, Koichi, 4,706,272, Cl. 379-57.000.

Nagata, Wataru; Aoki, Tsutomu; and Nishitani, Yasuhiro, to Shionogi & Co., Ltd. 1-oxadethia cephalosporin hydroxamic acid derivatives. 4,705,852, Cl. 540-301.000.

Nagle, Elliott V., Jr.: *See*—
Cullo, Leonard A.; Nagle, Elliott V., Jr.; Restelli, Edward F., Jr.; and Yogan, Thomas J., 4,705,770, Cl. 502-242.000.

Naito, Kazufumi, to Ishida Scales Manufacturing Company, Ltd. Signal processing circuit and weighing apparatus incorporating same. 4,705,126, Cl. 177-50.000.

Naito, Masataka: *See*—
Tanioka, Hiroshi; Ogino, Yoshitaka; Inoue, Yutaka; Naito, Masataka; and Hayakawa, Kimiaki, 4,706,128, Cl. 358-286.000.

Najjar, Mitri S.; and Kessler, Richard V., to Texaco Inc. Partial oxidation process. 4,705,538, Cl. 48-197.00R.

Najjar, Mitri S.; Becker, Michael W.; and Muan, Arnulf, to Texaco Inc. Partial oxidation process. 4,705,539, Cl. 48-197.00R.

Najjar, Mitri S.: *See*—
Becker, Michael W.; Stevenson, John S.; and Najjar, Mitri S., 4,705,536, Cl. 48-197.00R.
Yaghmaie, Farrokh; Najjar, Mitri S.; and Sorell, Louis S., 4,705,537, Cl. 48-197.00R.

Nakagawa, Akira: *See*—
Matsuda, Tatsuya; and Nakagawa, Akira, 4,705,304, Cl. 285-243.000.

Nakagawa, Kaoru; Ogura, Mitsugi; Natori, Kenji; and Masuoka, Fujio, to Kabushiki Kaisha Toshiba. Semiconductor memory device having error detection/correction function. 4,706,249, Cl. 371-38.000.

Nakagawa, Takashi: *See*—
Mizukami, Hidetada; Urata, Tsutomu; Nakagawa, Takashi; Hashimoto, Kunihiro; and Mizoguchi, Toshiaki, 4,705,279, Cl. 279-1.00L.

Nakagiri, Takashi: *See*—
Eguchi, Ken; Nishimura, Yukuo; Haruta, Masahiro; Matsuda, Hiroshi; Hirai, Yutaka; and Nakagiri, Takashi, 4,705,403, Cl. 356-319.000.

Nakai, Masaaki: *See*—
Mukai, Hiromu; Yamaki, Toshio; Fujino, Akihiko; Izumi, Shuji; Nakai, Masaaki; and Taniguchi, Nobuyuki, 4,705,382, Cl. 354-412.000.

Nakajima, Kenji, to Ariyoshi Nakamura. Apparatus for making connecting pipes for connecting ducts. 4,704,885, Cl. 72-50.000.

Nakajima, Ryoichi: *See*—
Tsuchitani, Masatoshi; and Nakajima, Ryoichi, 4,705,618, Cl. 208-44.000.

Nakamura, Kenji: *See*—
Fukunaga, Yukio; Shibahata, Yasuji; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,705,130, Cl. 180-140.000.
Shibahata, Yasuji; Fukunaga, Yukio; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,705,131, Cl. 180-140.000.

Nakamura, Masaru; Okajima, Masaki; Komatsubara, Tadashi; Sadamasa, Tetsuo; and Nitta, Koichi, to Kabushiki Kaisha Toshiba. Light emitting diode formed of a compound semiconductor material. 4,706,101, Cl. 357-17.000.

Nakamura, Masaya, to Tokyo Juki Industrial Co., Ltd. Button feed tape. 4,705,167, Cl. 206-348.000.

Nakanishi, Takao, to Sharp Kabushiki Kaisha. Damper drive in microwave heating appliance. 4,705,928, Cl. 219-10.55B.

Nakano, Akihiko; Hibino, Takeshi; Takata, Hajime; and Yoshida, Manabu, to Matsushita Electric Industrial Co., Ltd. Solar cell module. 4,705,911, Cl. 136-251.000.

Nakano, Masahiro: *See*—
Sakaguchi, Ushio; Nakano, Masahiro; and Uchida, Mitsukuni, 4,705,039, Cl. 128-334.00C.

Nakashima, Seiichiro; Toyoda, Kenichi; and Torii, Nobutoshi, to Fanuc Ltd. Industrial robot. 4,706,001, Cl. 318-568.000.

Nakashima, Seiichiro; Toyoda, Kenichi; and Sakakibara, Shinsuke, to Fanuc Ltd. Acceleration and deceleration control system. 4,706,003, Cl. 318-568.000.

Nakashima, Yukio; Haku, Hisao; Watanabe, Kaneo; and Matsuoka, Tsugufumi, to Sanyo Electric Co., Ltd. Photovoltaic device. 4,705,912, Cl. 136-258.000.

Nakayama, Mitsuhisa, to U.S. Philips Corporation. Disc player with strobe light illumination. 4,706,237, Cl. 369-75.100.

Nakayama, Susumu: *See*—
Itagaki, Masato; Kikuchi, Katsuaki; Nakayama, Susumu; Haeda, Yoshio; and Kawakami, Takashi, 4,704,792, Cl. 29-741.000.

Nakayama, Tetsuro, to Tokyo Electric Co., Ltd. Printing device. 4,706,098, Cl. 346-140.00R.

Nakazawa, Kiyoshi: *See*—
Hamada, Hiroshi; Nakazawa, Kiyoshi; Take, Hiroshi; Kimura, Naofumi; and Funada, Fumiaki, 4,706,173, Cl. 362-341.000.

Nalco Chemical Company: *See*—
Meier, Daniel A.; and Groshans, Michael J., 4,705,703, Cl. 427-239.000.

Nambudiri, Easwaran C. N.: *See*—
Kirschner, Wallace; Nambudiri, Easwaran C. N.; and Patterson, Douglas H., 4,706,215, Cl. 364-900.000.

Nannen, William G. Rotary lawn mower. 4,704,848, Cl. 56-17.200.

Nardi, Dante; Leonardi, Amedeo; Graziani, Gabriele; and Bianchi, Giorgio, to Recordati S.A., Chemical and Pharmaceutical Company. N-(3,3-diphenylpropyl) aminoethyl esters of 1,4-dihydro-2,6-dimethyl-pyridine-3,5-dicarboxylic acid, compositions and use. 4,705,797, Cl. 514-356.000.

Naruse, Masao: *See*—
Yamada, Koji; Hashimoto, Tamotsu; Naruse, Masao; Murayama, Yo; and Ninno, Hideki, 4,705,805, Cl. 514-548.000.

Nasu, Hisanori; Suzuki, Satoru; Yoshida, Hiroaki; Fukuda, Tomoichi; and Soeda, Eiichi, to Hitachi Software Engineering Co., Ltd. Input apparatus for entering base sequence information of the gene. 4,706,192, Cl. 364-413.000.

Natale, Anthony, to GPAC, Inc. Method of disposing of asbestos waste material. 4,705,429, Cl. 405-128.000.

National Gypsum Company: *See—*
Menchetti, Robert J.; and Chapman, Robert M., 4,704,837, Cl. 52-631.000.

National Icee Corporation: *See—*
Murphy, Michael; and Belszek, Henry, 4,704,827, Cl. 52-34.000.

National Machine Company, Inc.: *See—*
Cacioppo, Joseph C.; Wuerzer, Donald R.; and Piglia, Peter J., 4,705,976, Cl. 310-232.000.

National Research Development Corporation: *See—*
Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., 4,706,025, Cl. 324-309.000.
Lawrence, Carl A., 4,704,853, Cl. 57-401.000.
Willard, Reginald A.; and Percival, William S., 4,706,030, Cl. 324-322.000.

National Semiconductor Corporation: *See—*
Gross, William H., 4,705,969, Cl. 307-519.000.

Natori, Etsuji: *See—*
Suga, Shigeru; Chaki, Kiyoshi; Natori, Etsuji; Suga, Shigeo; and Mitamura, Katsuaki, 4,704,903, Cl. 73-159.000.

Natori, Kenji: *See—*
Nakagawa, Kaoru; Ogura, Mitsugi; Natori, Kenji; and Masuoka, Fujio, 4,706,249, Cl. 371-38.000.

Naughton, Frank C.: *See—*
Brauer, Melvin; Downey, William J.; and Naughton, Frank C., 4,705,723, Cl. 428-375.000.

Nava & C.S.P.A.: *See—*
Nava, Pier L., 4,704,746, Cl. 2-424.000.

Nava, Pier L., to Nava & C.S.P.A. Integral helmet. 4,704,746, Cl. 2-424.000.

Navidi, Salar; Trout, Brent L.; and Wernett, Fred C., to Motorola, Inc. Wideband linear Darlington cascode amplifier. 4,706,038, Cl. 330-271.000.

Navistar International Transportation Corp.: *See—*
Johnson, Roger L., 4,705,214, Cl. 237-12.30C.

Naylor, Geoffrey; and Wilkinson, Philip M., to Rieter Scragg Limited. False twisting apparatus. 4,704,858, Cl. 57-340.000.

NEC Corporation: *See—*
Akiyama, Ikuo, 4,706,122, Cl. 358-213.130.
Furukawa, Akihiro, 4,706,265, Cl. 375-122.000.
Inoue, Takeshi; and Nada, Takatoshi, 4,706,230, Cl. 367-174.000.
Kudo, Yoshihisa, 4,706,085, Cl. 342-825.560.
Minemura, Kouichi; Shikada, Minoru; and Emura, Katsumi, 4,706,300, Cl. 455-619.000.
Miyata, Shinobu; and Kinouchi, Takashige, 4,706,219, Cl. 365-189.000.
Nishimura, Izumi; and Nagata, Koichi, 4,706,272, Cl. 379-57.000.
Noguchi, Toshitake, 4,706,243, Cl. 370-69.100.
Ohta, Kiyoshi, 4,706,262, Cl. 375-60.000.
Sasage, Tsutomu; Matsumoto, Minoru; and Yoshikawa, Toru, 4,705,266, Cl. 271-264.000.

Nehring, Jurgen: *See—*
Amstutz, Hermann; Kaufmann, Meinolph; Nehring, Jurgen; and Scheffer, Terry J., 4,705,359, Cl. 350-341.000.

Neier, Wilhelm: *See—*
Brandes, Gunter; Neier, Wilhelm; and Webers, Werner, 4,705,808, Cl. 521-30.000.

Nelson, Thomas L., to Du Pont de Nemours, E. I., and Company. False twisted differential tension yarn. 4,704,856, Cl. 57-228.000.

Nemo, Thomas E., to Standard Oil Company (Indiana). Detergent lubricant compositions. 4,705,643, Cl. 252-51.50A.

Neotech Industries, Inc.: *See—*
Rocco, Art; and Ripley, David R., 4,704,901, Cl. 73-146.800.

Nerli, Giovanni; Grego, Francesco; Bottos, Roberto; and Ferro, Francesco, to Officine Savio S.p.A. Rotary twister element for frictional open-end spinning. 4,704,859, Cl. 57-401.000.

Netravali, Arun N.: *See—*
Budrikis, Zigmantas L.; Hatamian, Mehdi; Kubik, Peter S.; and Netravali, Arun N., 4,705,942, Cl. 250-227.000.

Neturen Co., Ltd.: *See—*
Yamazaki, Takao, 4,705,580, Cl. 148-154.000.

Neumuller, Matthias: *See—*
Muller, Karl-Hans; Neumuller, Matthias; and Turk, Gunther, 4,705,679, Cl. 424-52.000.

Newel-Lewis, Jan, to Alternate Resources PLC. Indicator device. 4,705,182, Cl. 215-230.000.

Newell, Richard A.: *See—*
Callen, Patrick J.; Bingley, John D.; and Newell, Richard A., 4,706,010, Cl. 323-225.000.

Nezuka, Kenjiro: *See—*
Suketomo, Toshitaka; and Nezuka, Kenjiro, 4,704,922, Cl. 74-733.000.

NGK Spark Plug Co., Ltd.: *See—*
Inuzuka, Shozin; and Yamashita, Shuji, 4,704,894, Cl. 73-35.000.
Kojima, Takio; and Taniguchi, Masato, 4,704,998, Cl. 123-271.000.
Wakita, Naomasa; and Okuda, Makoto, 4,705,365, Cl. 350-487.000.

Nichols, Richard W.; Zabrodski, William J.; and Mitra, Abhijit, to Rohm and Haas Company. DDTR-free 1,1-bis(chlorophenyl)-2,2,2-trichloroethanol. 4,705,902, Cl. 568-810.000.

Nickels, Helmut; and Hackenberger, Alfred, to BASF Aktiengesellschaft. Preparation of fatty acid esters of ascorbic acid. 4,705,869, Cl. 549-317.000.

Nicolet Instrument Corporation: *See—*
Niemeyer, Robert, 4,705,419, Cl. 401-65.000.

Niemeyer, Robert, to Nicolet Instrument Corporation. Mechanical pencil with automatic lead advance. 4,705,419, Cl. 401-65.000.

Nifco Inc.: *See—*
Mizusawa, Akira, 4,705,190, Cl. 220-375.000.
Okawa, Toshiya, 4,705,425, Cl. 403-376.000.
Osada, Hiroshi, 4,704,929, Cl. 81-451.000.
Osada, Hiroshi, 4,705,245, Cl. 248-74.300.

Nihon Sekiso Kogyo: *See—*
Saotome, Kaoru; Sasaki, Hiroyuki; and Kanbara, Katsuhiro, 4,705,244, Cl. 248-68.100.

Nihon Shinku Gijutsu Kabushiki Kaisha: *See—*
Kimura, Hiroshi; and Abiko, Kenji, 4,705,366, Cl. 350-529.000.

Niimi, Koji: *See—*
Kakubo, Yuji; Niimi, Koji; and Ikegaya, Yuji, 4,706,291, Cl. 381-63.000.

Nikko Co., Ltd.: *See—*
Ishimoto, Zenichi, 4,705,487, Cl. 446-290.000.

Ninno, Hideki: *See—*
Yamada, Koji; Hashimoto, Tamotsu; Naruse, Masao; Murayama, Yo; and Ninno, Hideki, 4,705,805, Cl. 514-548.000.

Ninomiya, Ken: *See—*
Okudaira, Sadayuki; Nishimatsu, Shigeru; Suzuki, Keizo; Ninomiya, Ken; and Hamazaki, Ryoji, 4,705,595, Cl. 156-643.000.

Nippon Coinco Co., Ltd.: *See—*
Kobayashi, Osamu; Akagawa, Masaki; Tanaka, Masanori; Ishii, Jun; and Yamagishi, Ryoji, 4,706,202, Cl. 364-479.000.

Nippon Electric Co., Ltd.: *See—*
Terada, Kazuo; Kurosawa, Susumu; and Suzuki, Shunichi, 4,706,107, Cl. 357-23.500.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Kakubo, Yuji; Niimi, Koji; and Ikegaya, Yuji, 4,706,291, Cl. 381-63.000.
Kurakake, Yasushi, 4,704,933, Cl. 84-1.030.
Mishima, Junichi, 4,704,932, Cl. 84-1.030.
Nagai, Yohei; and Isozaki, Yoshimasa, 4,704,931, Cl. 84-1.010.

Nippon Kogaku K. K.: *See—*
Wakamiya, Koichi, 4,705,364, Cl. 350-463.000.

Nippon Paint Co., Ltd.: *See—*
Ito, Takeyasu; and Kuwajima, Teruaki, 4,705,821, Cl. 524-407.000.

Nippon Pillar Packing Co., Ltd.: *See—*
Ueda, Takahisa; and Shiomi, Tomikazu, 4,705,722, Cl. 428-365.000.

Nippon Shiken Dental Co., Ltd.: *See—*
Ohtsuka, Masasuke; Harada, Yoshinori; Tokita, Shigeo; and Maniwa, Hideyo, 4,705,836, Cl. 526-318.100.

Nippon Soken, Inc.: *See—*
Hashikawa, Atsushi; Kitagawa, Nozomi; and Kikuchi, Tetsuro, 4,704,999, Cl. 123-299.000.
Imoto, Yuzo; Takei, Toshihiro; Hattori, Yoshiyuki; Uno, Haruhiko; Inagaki, Mitsuo; and Takeda, Kenji, 4,705,323, Cl. 303-116.000.
Ohta, Minoru; Miura, Kazuhiko; Onoda, Michitoshi; Iwasaki, Yukio; and Hattori, Tadashi, 4,705,713, Cl. 428-209.000.
Sakakibara, Yasuyuki; Abe, Seiko; Tomita, Masahiro; Yorita, Hiroshi; Tanaka, Takeshi; and Igashira, Toshihiko, 4,705,003, Cl. 123-449.000.
Yoshino, Yasuhisa; Kago, Yoshiyuki; Sakakibara, Hiroyuki; and Shinoda, Yoshio, 4,706,195, Cl. 364-426.000.

Nippon Steel Corporation: *See—*
Fujii, Taisuke, 4,705,579, Cl. 148-142.000.
Shindou, Yoshio; Oka, Joji; Taira, Taketoshi; Miyauchi, Yujiro; and Yamazaki, Fumio, 4,705,726, Cl. 428-562.000.

Nippon Yakin Kogyo Co., Ltd.: *See—*
Onoyama, Takashi; and Makino, Hiroshi, 4,705,656, Cl. 264-8.000.

Nippondenso Co., Ltd.: *See—*
Hattori, Yoshiyuki; Nomura, Ken; Goshima, Takahiro; and Tanaka, Hitoshi, 4,705,492, Cl. 474-49.000.
Imoto, Yuzo; Takei, Toshihiro; Hattori, Yoshiyuki; Uno, Haruhiko; Inagaki, Mitsuo; and Takeda, Kenji, 4,705,323, Cl. 303-116.000.
Kamiya, Hiroshi; Iguchi, Takeshi; and Fukumi, Shigenobu, 4,705,206, Cl. 228-183.000.
Matsumura, Toshimi; Sumitani, Shinya; Hayakawa, Takahiro; Hasegawa, Takashi; and Sakakibara, Shuji, 4,705,000, Cl. 123-357.000.
Muramatsu, Toshihiko; Isomura, Shigenori; and Harada, Takashi, 4,706,196, Cl. 364-431.050.
Yoshino, Yasuhisa; Kago, Yoshiyuki; Sakakibara, Hiroyuki; and Shinoda, Yoshio, 4,706,195, Cl. 364-426.000.

Nishi, Masatsugu: *See—*
Michiguchi, Yoshihiro; Takahashi, Fuminobu; Hiramoto, Kazuo; Nishi, Masatsugu; and Sonoda, Shinji, 4,706,031, Cl. 324-337.000.

Nishiguchi, Yasuo; Minami, Keijiro; and Hoda, Masakazu, to Kyocera Corporation. Electron beam formation of a thermal head using titanium silicide. 4,705,697, Cl. 427-36.000.

Nishimatsu, Shigeru: *See—*
Okudaira, Sadayuki; Nishimatsu, Shigeru; Suzuki, Keizo; Ninomiya, Ken; and Hamazaki, Ryoji, 4,705,595, Cl. 156-643.000.

Nishimura, Hiroshi; and Miyasaka, Masao, to Hitachi Koki Company, Limited. Device for cleaning a type-carrier. 4,704,963, Cl. 101-425.000.

Nishimura, Izumi; and Nagata, Koichi, to NEC Corporation. Paging communication system. 4,706,272, Cl. 379-57.000.

Nishimura, Kosuke: *See*—
Honda, Toshio; and Nishimura, Kosuke, 4,705,211, Cl. 235-380.000.
Nishimura, Ryoji: *See*—
Yamada, Seiji; Konishi, Satoshi; Kono, Katsuaki; and Nishimura, Ryoji, 4,705,125, Cl. 177-25.000.
Nishimura, Shinichi, to Tokyo Kogaku Kikai Kabushiki Kaisha. Non-coatact type tonometer. 4,705,045, Cl. 128-648.000.
Nishimura, Yasunobu: *See*—
Matsumoto, Masakatsu; and Nishimura, Yasunobu, 4,705,884, Cl. 560-109.000.
Nishimura, Yukuo: *See*—
Eguchi, Ken; Nishimura, Yukuo; Haruta, Masahiro; Matsuda, Hiroshi; Hirai, Yutaka; and Nakagiri, Takashi, 4,705,403, Cl. 356-319.000.
Nishitani, Yasuhiro: *See*—
Nagata, Wataru; Aoki, Tsutomu; and Nishitani, Yasuhiro, 4,705,852, Cl. 540-301.000.
Nissan Motor Co., Ltd.: *See*—
Fukunaga, Yukio; Shibahata, Yasuji; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,705,130, Cl. 180-140.000.
Imajo, Minoru; and Kawakita, Tsunehiro, 4,706,193, Cl. 364-424.000.
Shibahata, Yasuji; Fukunaga, Yukio; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,705,131, Cl. 180-140.000.
Suzuki, Tadashi; Tomikashi, Minoru; Futami, Toru; and Sakagami, Atsushi, 4,706,245, Cl. 370-85.000.
Taniguchi, Fumio; and Matsuno, Tomio, 4,705,099, Cl. 165-12.000.
Tsuchiya, Masuo, 4,705,132, Cl. 180-148.000.
Nitta, Koichi: *See*—
Nakamura, Masaru; Okajima, Masaki; Komatsubara, Tadashi; Sadamasa, Tetsuo; and Nitta, Koichi, 4,706,101, Cl. 357-17.000.
Nittetsu Steel Drum Co., Ltd.: *See*—
Tsukamura, Takao, 4,705,184, Cl. 220-67.000.
Niwa, Kensuke; Fujita, Hisayoshi; Saito, Yoshihiko; Makihara, Hiroshi; Hashimoto, Ritsuo; Hoshi, Younosuke; and Murayama, Katsutoshi, to Mitsubishi Jukogyo Kabushiki Kaisha; and Mitsubishi Gas Chem. Company, Inc. Method of humidifying a gas. 4,705,654, Cl. 261-128.000.
Nix, Richard A.: *See*—
Leigh-Monstevens, Keith V.; Nix, Richard A.; and Patalidis, Claude A., deceased, 4,705,151, Cl. 192-111.00A.
NL Industries, Inc.: *See*—
Coope, Daniel F., 4,705,944, Cl. 250-254.000.
NL Petroleum Products Limited: *See*—
Wardley, Michael T.; and Shirley-Fisher, David N., 4,705,122, Cl. 175-329.000.
Nobuta, Hiroshi, to Canon Kabushiki Kaisha. Image processing apparatus. 4,706,127, Cl. 358-280.000.
Nock, Anthony: *See*—
Brophy, John H.; and Nock, Anthony, 4,705,906, Cl. 585-262.000.
Noding, Stephen A., to Dow Chemical Company, The. Flow-through electrolytic cell. 4,705,564, Cl. 75-120.000.
Noeske, Manfred: *See*—
Boing, Rolf; Frase, Dietmar; and Noeske, Manfred, 4,704,895, Cl. 73-104.000.
Noguchi, Aiko: *See*—
Tanaka, Yukitaka; Irinatsu, Yuichi; Noguchi, Aiko; and Kobayashi, Takashi, 4,705,692, Cl. 426-607.000.
Noguchi, Toshitake, to NEC Corporation. Single-channel-per-carrier communication system including a voice-activated transmission power controller. 4,706,243, Cl. 370-69.100.
Nojiri, Hidetoshi; Miyazawa, Seiichi; Hakamada, Isao; and Hajimoto, Yoshioki, to Canon Kabushiki Kaisha. Semiconductor device and its fabrication. 4,706,254, Cl. 372-46.000.
Nomura, Etsuzo; Kozawa, Tetsuo; and Sakakibara, Yasuo, to Brother Kogyo Kabushiki Kaisha. Sewing machine having an automatic control system. 4,704,978, Cl. 112-275.000.
Nomura, Ken: *See*—
Hattori, Yoshiyuki; Nomura, Ken; Goshima, Takahiro; and Tanaka, Hitoshi, 4,705,492, Cl. 474-49.000.
Nonini, Geremia: *See*—
Poloni, Alfredo; and Nonini, Geremia, 4,704,889, Cl. 72-428.000.
Nordson Corporation: *See*—
Rubinstein, Mordecai, 4,704,985, Cl. 118-316.000.
Wilson, Scott T., 4,704,953, Cl. 98-115.200.
Norris, Brian, to Rohr Industries, Inc. Method of brazing columbium to itself using low bonding pressures and temperatures. 4,705,207, Cl. 228-194.000.
Northern Telecom Limited: *See*—
Robidoux, Richard R.; and Hoverman, Ronald B., 4,706,033, Cl. 328-139.000.
Wadhera, Anil K.; Tang, Alex K.; and Basser, Theodore E., 4,705,916, Cl. 174-35.0GC.
Zuber, Bretislav P., 4,705,583, Cl. 156-52.000.
Northrop Corporation: *See*—
Lim, Wah L.; Hauck, James P.; and Raquet, Jack W., 4,705,398, Cl. 356-350.000.
Noshay, David A.: *See*—
Kovacic, Charles R.; and Noshay, David A., 4,706,065, Cl. 340-303.000.
Nosrati, Mohammad. Musical balloon. 4,704,934, Cl. 84-94.200.
Notaro, Giuseppe: *See*—
DeFilippis, Pietro; Calenda, Ciro; and Notaro, Giuseppe, 4,706,152, Cl. 361-32.000.
Notley, Norman T., to Minnesota Mining and Manufacturing Company. Thermal diazo composition. 4,705,736, Cl. 430-138.000.
Noudomi, Ryoichi: *See*—
Egawa, Akira; and Noudomi, Ryoichi, 4,706,252, Cl. 372-38.000.
Nova Cellitrak, Inc.: *See*—
Hennessy, James W.; Angel, Henry R.; and Carlson, Richard A., 4,706,207, Cl. 364-555.000.
Nowak, Reiner: *See*—
Graser, Franz; Langer, Werner; and Nowak, Reiner, 4,705,210, Cl. 239-585.000.
NRM Corporation: *See*—
Enders, George E., 4,705,589, Cl. 156-401.000.
Nukushina, Masanori, to Tokyo Juki Industrial Co., Ltd. Method and apparatus for preparing sewing data. 4,704,977, Cl. 112-266.100.
Nunn, Adrian D.; Feld, Thomas A.; and Treher, Elizabeth N., to E. R. Squibb & Sons, Inc. Boronic acid adducts of technetium-99m dioxime complexes. 4,705,849, Cl. 534-14.000.
Nyegaard & Co. A/S: *See*—
Benneche, Tore; and Undheim, Kjell, 4,705,791, Cl. 514-274.000.
Nyfeler, Robert; and Ehrenfreund, Josef, to Ciba-Geigy Corporation. Difluorbenzodioxyl cyanopyrrole microbicidal compositions. 4,705,800, Cl. 514-422.000.
Oba, Seisuke; Mikami, Tsutomu; Suzuki, Hideyuki; Shimada, Mitsuhiro; and Suzuki, Tadashi, to Sony Corporation. Video tape recorder with first and second loading positions. 4,706,141, Cl. 360-96.500.
Obata, Kosei: *See*—
Matsunaga, Hiroshi; Tokunaga, Ichiro; Shimojima, Yoji; and Obata, Kosei, 4,705,348, Cl. 350-96.150.
Oberlin, Claude: *See*—
Dolhen, Gerard; Oberlin, Claude; Lemarquis, Jean-Claude; and Bandura, Daniel, 4,705,259, Cl. 251-61.100.
Obermeier, Dale T. Crop lifting attachment for combine snout. 4,704,850, Cl. 56-119.000.
Oce-Nederland B.V.: *See*—
Huntjens, Joseph M. J. E.; Kockelmans, Henricus G. J. M.; and Pleyers, Jozef J. A., 4,705,388, Cl. 355-15.000.
Peeters, Hendrikus W. J.; van Kuringen, Hendricus M. J. C.; and Hoeymakers, Gerardus M., 4,705,391, Cl. 355-77.000.
Oden, Kenneth W., to Dixie-Narco. Article vendor with adjustable column transfer provision for accomodating locally-prevalent space-to-sales ratio. 4,705,176, Cl. 211-59.200.
Oerding, Horst, to Felasto Pur GmbH & Co. KG. Endless track having synthetic plates with chain link connections. 4,705,325, Cl. 305-35.00R.
Officine Savio S.p.A.: *See*—
Nerli, Giovanni; Grego, Francesco; Bottos, Roberto; and Ferro, Francesco, 4,704,859, Cl. 57-401.000.
Ogaga, Tetsuo: *See*—
Abe, Takao; and Ogaga, Tetsuo, 4,706,111, Cl. 358-21.00R.
Ogawa, Kyosuke: *See*—
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,705,730, Cl. 430-57.000.
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,705,731, Cl. 430-57.000.
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,705,732, Cl. 430-57.000.
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Ogg, Robert: *See*—
Foster, John D., 4,704,949, Cl. 92-160.000.
Ogino, Kinji, to Akebono Brake Industry Co., Ltd.; and Akebono Research and Development Centre Ltd. Method of casting the fiber-reinforced caliper. 4,705,093, Cl. 164-97.000.
Ogino, Yoshitaka: *See*—
Tanioka, Hiroshi; Ogino, Yoshitaka; Inoue, Yutaka; Naito, Masataka; and Hayakawa, Kimiaki, 4,706,128, Cl. 358-286.000.
Ogita, Akira; and Tanaka, Masaaki, to Shinko Electric Co., Ltd.; and Fuji Xerox Co., Ltd. Color copying machine. 4,705,386, Cl. 355-4.000.
Ogura, Mitsugi: *See*—
Nakagawa, Kaoru; Ogura, Mitsugi; Natori, Kenji; and Masuoka, Fujio, 4,706,249, Cl. 371-38.000.
O'Hare, Louis R. Multiple oxidation nitrogen fixation. 4,705,670, Cl. 422-186.040.
Ohgoshi, Seiichi: *See*—
Yamada, Hisashi; and Ohgoshi, Seiichi, 4,705,941, Cl. 250-201.000.
Ohigashi, Tugio: *See*—
Masho, Yukio; Kakimi, Shigeru; Ueki, Toru; Miyauchi, Satoshi; Ohigashi, Tugio; and Kurohata, Hitoshi, 4,705,154, Cl. 194-319.000.
Ohkura, Yosuke, to Toyo Soda Manufacturing Co., Ltd. Method for fluorometric analysis of catechol amines. 4,705,757, Cl. 436-172.000.
Ohlendorf, Dieter; Hoffmann, Heinz; Interthal, Werner; and Pintschovius, Ulrich, to Hoechst Aktiengesellschaft. Quaternary ammonium salts and their use as drag reducing agents. 4,705,860, Cl. 546-347.000.

Ohlig, Albert H. Vacuum apparatus blanket and method of making the same. 4,705,392, Cl. 355-91.000.
Ohmori, Kouichi, to Canon Kabushiki Kaisha. Charge completion confirming device for flash light devices. 4,705,373, Cl. 354-127.110.
Ohta, Kiyoshi, to NEC Corporation. FSK or FM burst signal generating apparatus. 4,706,262, Cl. 375-60.000.
Ohta, Minoru; Miura, Kazuhiko; Onoda, Michitoshi; Iwasaki, Yukio; and Hattori, Tadashi, to Nippon Soken, Inc. Film resistor for flow measuring apparatus. 4,705,713, Cl. 428-209.000.
Ohtaka, Tadashi, to Hitachi, Ltd. Specimen-exchanging apparatus. 4,705,950, Cl. 250-441.100.
Ohtsuka, Masasuke; Harada, Yoshinori; Tokita, Shigeo; and Maniwa, Hideyo, to Nippon Shiken Dental Co., Ltd. Polymerization composition containing vinyl benzoic acid or a derivative thereof and a vinyl compound. 4,705,836, Cl. 526-318.100.
Oikawa, Eigo: *See*—
Arai, Yoshinao; Takahashi, Shino; Oikawa, Eigo; Sato, Shigeru; and Kobayashi, Hideaki, 4,706,187, Cl. 364-191.000.
Oishi, Kengo: *See*—
Komiyama, Choji; and Oishi, Kengo, 4,706,148, Cl. 360-132.000.
Oji Yuka Goseishi Co., Ltd.: *See*—
Yamanaka, Masaaki; Inoue, Masayuki; and Asazuma, Harumitsu, 4,705,719, Cl. 428-323.000.
Oka, Joji: *See*—
Shindou, Yoshio; Oka, Joji; Taira, Taketoshi; Miyauchi, Yujiro; and Yamazaki, Fumio, 4,705,726, Cl. 428-562.000.
Okabe, Kazuhiko: *See*—
Sotoya, Koshiro; Kubo, Makoto; and Okabe, Kazuhiko, 4,705,893, Cl. 562-564.000.
Okada, Hiroo, to Olympus Optical Co., Ltd. Head feed control apparatus. 4,706,234, Cl. 369-41.000.
Okada, Minoru, to Osaka Taiyu Co., Ltd. Fluid motor with rotary output. 4,704,946, Cl. 91-7.000.
Okajima, Masaki: *See*—
Nakamura, Masaru; Okajima, Masaki; Komatsubara, Tadashi; Sadamasa, Tetsuo; and Nitta, Koichi, 4,706,101, Cl. 357-17.000.
Okamoto, Tetsuo: *See*—
Sugiura, Saburo; Kanada, Kenji; Demukai, Noboru; and Okamoto, Tetsuo, 4,706,258, Cl. 373-2.000.
Okano, Tamon; Kumobayashi, Hidenori; Akutagawa, Susumu; Kiji, Jitsuo; Konishi, Hisatoshi; Fukuyama, Keiichi; and Shimano, Yasunobu, to Takasago Perfumery Co., Ltd. 5,5'-diamino or 5,5'-diacetamido-2,2'-bis(diphenylphosphino)-1,1'-binaphthyls. 4,705,895, Cl. 564-15.000.
Okawa, Toshiya, to Nifco Inc. Panel coupler. 4,705,425, Cl. 403-376.000.
Okita, Koichi; Toyooka, Shinichi; Asako, Shigeru; and Yamada, Katsuya, to Sumitomo Electric Industries, Ltd. Liquid membrane. 4,705,544, Cl. 55-158.000.
Okrzesik, Thaddeus P.; and Alvord, Robert J., to Zenith Electronics Corporation. Astable multivibrator with duty cycle compensation. 4,706,044, Cl. 331-113.00R.
Okuda, Makoto: *See*—
Wakita, Naomasa; and Okuda, Makoto, 4,705,365, Cl. 350-487.000.
Okuda, Takao: *See*—
Yamada, Hirotada; Masai, Naruhito; Ueda, Sinji; Okuda, Takao; Fukasawa, Masatomo; Kato, Masuhiro; and Fukumura, Masataka, 4,705,784, Cl. 514-202.000.
Okudaira, Sadayuki; Nishimatsu, Shigeru; Suzuki, Keizo; Ninomiya, Ken; and Hamazaki, Ryoji, to Hitachi, Ltd. Method for microwave plasma processing. 4,705,595, Cl. 156-643.000.
Okui, Susumu: *See*—
Maekawa, Yoshikazu; and Okui, Susumu, 4,705,389, Cl. 355-26.000.
Okuno, Kohichi: *See*—
Saito, Yasuhisa; Takagishi, Hisao; Watanabe, Katsuya; Okuno, Kohichi; Kenmei, Junichi; and Kamio, Kunimara, 4,705,833, Cl. 525-504.000.
Olesen, Paul; and Lin, Frank H., to Swingline Inc. Cartridge plier stapler. 4,705,202, Cl. 227-153.000.
Olin Hunt Specialty Products Inc.: *See*—
Calabrese, Peter J.; and Pismennaya, Galina, 4,705,696, Cl. 427-14.100.
Olsen, Cris M.: *See*—
Almquist, Ronald G.; and Olsen, Cris M., 4,705,778, Cl. 514-15.000.
Olsson, Per I.; and Sedwall, Yngve G., to Danfoss A/S. Mixer tap. 4,705,074, Cl. 137-625.460.
Olympus Optical Co., Ltd.: *See*—
Arai, Keiichi, 4,705,023, Cl. 128-4.000.
Funada, Saburo; Yoda, Yoshiro; Yoshikawa, Shoji; Doi, Masanori; and Sugawara, Kazutake, 4,706,232, Cl. 369-13.000.
Inoue, Yasuo; and Shinohara, Daizo, 4,705,381, Cl. 354-411.000.
Karaki, Kouichi; and Uchino, Fumio, 4,706,185, Cl. 367-110.000.
Kato, Shinichi; Sasaki, Masahiko; Kato, Tadashi; Kanno, Masahide; Takahashi, Yutaka; and Saito, Katsuyuki, 4,706,118, Cl. 358-98.000.
Kimura, Hiroshi; and Abiko, Kenji, 4,705,366, Cl. 350-529.000.
Okada, Hiroo, 4,706,234, Cl. 369-41.000.
Yoda, Yoshiro, 4,706,236, Cl. 369-59.000.
Omron Tateisi Electronics Co.: *See*—
Kiyono, Yasuhiro; and Takeyama, Yutaka, 4,705,959, Cl. 307-9.000.
Ondracek, Gerhard, to Kernforschungszentrum Karlsruhe GmbH. Nuclear fuel element containing low-enrichment uranium and method for producing same. 4,705,577, Cl. 148-11.50P.
O'Neill, James J. Wallet for joggers. 4,705,086, Cl. 150-134.000.
Onishi, Yasushi: *See*—
Kish, Hajimu; Seki, Masaki; Takegahara, Takashi; and Onishi, Yasushi, 4,706,201, Cl. 364-474.000.
Ono, Tsutomu; and Kashiwaba, Tadao, to Kabushiki Kaisha Sato. Portable thermal label printer. 4,706,095, Cl. 346-76.0PH.
Ono, Yotsuo: *See*—
Yagita, Koji; and Ono, Yotsuo, 4,705,632, Cl. 210-500.230.
Onoda, Michitoshi: *See*—
Ohta, Minoru; Miura, Kazuhiko; Onoda, Michitoshi; Iwasaki, Yukio; and Hattori, Tadashi, 4,705,713, Cl. 428-209.000.
Onoda, Shigeyoshi: *See*—
Mizutani, Morikazu; Onoda, Shigeyoshi; and Kanemitsu, Shinji, 4,705,384, Cl. 355-3.00R.
Onodera, Toshihiro, to Kabushiki Kaisha Toshiba. Digital radiography apparatus. 4,706,268, Cl. 378-99.000.
Onoyama, Takashi; and Makino, Hiroshi, to Nippon Yakin Kogyo Co., Ltd. Method for producing spherical metal particles. 4,705,656, Cl. 264-8.000.
Onuma, Akiyoshi: *See*—
Yabe, Kiyoshi; and Onuma, Akiyoshi, 4,705,144, Cl. 185-40.00R.
Oosterwijk, Theodorus M.: *See*—
Dieleman, Pieter J.; Goedbloed, Willem; De Jong, Roelof P.; and Oosterwijk, Theodorus M., 4,706,051, Cl. 333-212.000.
Oppenlaender, Knut: *See*—
Baur, Richard; Oppenlaender, Knut; and Barthold, Klaus, 4,705,834, Cl. 525-540.000.
Opti Patent- Forschungs-und Fabrikations-AG: *See*—
Frohlich, Alfons, 4,704,781, Cl. 29-408.000.
Optical Coating Laboratory, Inc.: *See*—
Berning, Peter H.; and Phillips, Roger W., 4,705,300, Cl. 283-91.000.
Berning, Peter H.; and Phillips, Roger W., 4,705,356, Cl. 350-166.000.
Oren, Meir. Device for holding skis during storage. 4,705,177, Cl. 211-70.500.
Orje, Christer H., to Broderna Holmbergs Fabriks AB. Lock for safety belts and lock tongue thereof. 4,704,771, Cl. 24-574.000.
Orkin, Stanley S.; and Carlson, Craig L., to Kamatics Corporation. Composite material force or motion transmitting member. 4,704,918, Cl. 74-579.00R.
O'Rourke, Ronald L.: *See*—
Sung, Rodney L.; Zoleski, Benjamin H.; and O'Rourke, Ronald L., 4,705,642, Cl. 252-47.500.
Orrico, Mario M. V.: *See*—
Gut, Edward B.; and Orrico, Mario M. V., 4,705,066, Cl. 137-486.000.
Ortho Pharmaceutical (Canada) Ltd.: *See*—
Lau, Catherine Y., 4,705,687, Cl. 424-95.000.
Ortho Pharmaceutical Corporation: *See*—
Schwender, Charles F.; and Dodd, John H., 4,705,785, Cl. 514-211.000.
Orvik, Jon A.; and Dietsche, Thomas J., to Dow Chemical Company, The. Polychloropyridine production from polychloro-2,3-lutidines. 4,705,859, Cl. 546-345.000.
Osada, Hiroshi, to Nifco Inc. Device for setting screw. 4,704,929, Cl. 81-451.000.
Osada, Hiroshi, to Nifco Inc. Device for binding wires or the like. 4,705,245, Cl. 248-74.300.
Osaka Taiyu Co., Ltd.: *See*—
Okada, Minoru, 4,704,946, Cl. 91-7.000.
Ostrander, John L.: *See*—
Hinton, Harvard S.; and Ostrander, John L., 4,705,344, Cl. 350-3.730.
Ota, Kazuhide; and Abe, Susumu, to Toyota Jidosha Kabushiki Kaisha. Process for producing ultra-fine ceramic particles. 4,705,762, Cl. 501-87.000.
Otis Engineering Corporation: *See*—
Council, Malcolm N.; and Baker, Walter, 4,705,107, Cl. 166-170.000.
Ouchida, Kenji, to Alpine Electronics Inc. Audio control device. 4,706,294, Cl. 381-109.000.
Outokumpu Oy: *See*—
Honkaniemi, Matti E.; Mustikka, Lauri A.; Jankkila, Martti J.; Hokkanen, Pentti O.; Heikkila , Risto M.; and Lilja, Launo L., 4,705,474, Cl. 432-14.000.
Ouyang, Kenneth W.; and Hull, Richard W., to Western Digital Corporation. Voltage controlled oscillator with dual loop resonant tank circuit. 4,706,045, Cl. 331-117.0FE.
Overhead Door Corporation of Texas: *See*—
DuVall, Dale R.; Bateson, John E.; Hewitt, Lew V.; and Hewitt, David P., 4,706,227, Cl. 367-96.000.
Owen, Dave L.; and Domnitz, David K., to W. R. Grace & Co., Cryovac Div. Apparatus and method for packaging articles. 4,704,843, Cl. 53-450.000.
Owen, Thomas E.; and Schroeder, Edgar C., to Southwest Research Institute. Asymmetrical lateral-force seismic source transducer. 4,706,228, Cl. 367-147.000.
Owens, Alexander H.: *See*—
Pan, David S.; Sarma, Kanak C.; Halfacre, Mark A.; Owens, Alexander H.; and Rosier, Brian K., 4,706,102, Cl. 357-23.500.
Oy Tampella AB: *See*—
Hautala, Jouko; and Pikkujamsa, Esa, 4,705,631, Cl. 210-403.000.
Ozaki, Kitao: *See*—
Hasegawa, Mineo; and Ozaki, Kitao, 4,705,755, Cl. 435-316.000.

Ozato, Yukinori: *See*—
Yamamoto, Michihiro; Ozato, Yukinori; Tamura, Nobuhiko; Miyagishi, Akira; and Hara, Youichi, 4,705,786, Cl. 514-252.000.
Ozawa, Kazuo: *See*—
Machida, Tetsuo; and Ozawa, Kazuo, 4,706,149, Cl. 360-132.000.
Ozen Corporation: *See*—
Koike, Eishi, 4,705,994, Cl. 318-16.000.
PA Consulting Services Limited: *See*—
Harry, Alan, 4,705,417, Cl. 400-235.000.
Pacific Bell: *See*—
Carse, Gregg D., 4,706,241, Cl. 370-60.000.
Packaging Automation Machinery Co. Ltd.: *See*—
Lipes, Arnold; and Soga, George, 4,706,298, Cl. 383-71.000.
Pagdin, Brian C., to Solex (UK) Limited. Electromagnetically-operable fluid injectors. 4,705,219, Cl. 239-397.500.
Page, Jack C.: *See*—
Wyatt, William G.; and Page, Jack C., 4,704,804, Cl. 34-15.000.
Palett, Anthony P.: *See*—
Spear, A. Gil; and Palett, Anthony P., 4,706,273, Cl. 379-58.000.
Palm, Charles S.; Slayton, Danny L.; Lak, Khosrow; Sampson, Peter F.; Davis, David R.; Wheatley, Maurice S., Jr.; Chatham, Gregory A.; Jones, Wayne C.; Charles, Kirk W.; and Ireland, Anthony J., to Colorocs Corporation. Print engine for color electrophotography. 4,705,385, Cl. 355-4.000.
Palmieri, Joseph M.: *See*—
Hampton, Thomas G.; Mitsch, James M.; Palmieri, Joseph M.; Parker, David S.; and DeRosier, Donna C., 4,706,054, Cl. 335-203.000.
Pan, David S.; Sarma, Kanak C.; Halfacre, Mark A.; Owens, Alexander H.; and Rosier, Brian K., to Sprague Electric Company. Memory device with interconnected polysilicon layers and method for making. 4,706,102, Cl. 357-23.500.
Panizza, Ettore, to Fiat Auto S.p.A. System for communication and automatic signalling between a plurality of motor vehicles. 4,706,086, Cl. 340-902.000.
Paradis, Benoit. Suction type hair clipper. 4,704,794, Cl. 30-133.000.
Paramore, Alvie R., Jr. Scraper pan with cutting blade. 4,704,812, Cl. 37-141.00R.
Parein, Eric W. M. V. Package for matches. 4,705,164, Cl. 206-98.000.
Park, Chung P., to Dow Chemical Company, The. Expandable polymeric composition and method. 4,705,811, Cl. 521-88.000.
Parker, David S.: *See*—
Hampton, Thomas G.; Mitsch, James M.; Palmieri, Joseph M.; Parker, David S.; and DeRosier, Donna C., 4,706,054, Cl. 335-203.000.
Parks, Harold G.: *See*—
Possin, George E.; Parks, Harold G.; and Piper, William W., 4,704,783, Cl. 437-40.000.
Parnham, Michael J.: *See*—
Lautenschlager, Hans-Heiner; Parnham, Michael J.; Leyck, Sigurd; Winkelmann, Johannes; and Brekle, Axel, 4,705,802, Cl. 514-438.000.
Paros, Jerome M.; Tonn, Jeffrey F.; and Wearn, Richard B., Jr., to Sundstrand Data Control, Inc. Mounting and isolation system for tuning fork temperature sensor. 4,706,259, Cl. 374-117.000.
Parsons, Norman H., to D-Tec, Inc. Air gage assembly. 4,704,896, Cl. 73-37.900.
Pasdeloup, Jacques: *See*—
Maures, Michel; Pasdeloup, Jacques; and Lespinasse, Patrick, 4,705,655, Cl. 264-3.400.
Passafiume, John E.: *See*—
Cronch, Darell D.; Fisher, Richard T.; Graham, Patricia A.; and Passafiume, John E., 4,706,008, Cl. 318-696.000.
Patalidis, Claude A., deceased: *See*—
Leigh-Monstevens, Keith V.; Nix, Richard A.; and Patalidis, Claude A., deceased, 4,705,151, Cl. 192-111.00A.
Patalidis, Monique, executrix: *See*—
Leigh-Monstevens, Keith V.; Nix, Richard A.; and Patalidis, Claude A., deceased, 4,705,151, Cl. 192-111.00A.
Patel, Arvind M., to International Business Machines Corporation. Method and apparatus for correcting multibyte errors having improved two-level code structure. 4,706,250, Cl. 371-39.000.
Patel, Bhupendra C., to Kendall Company, The. Suprapubic catheter with dual balloons. 4,705,502, Cl. 604-49.000.
Patterson, Douglas H.: *See*—
Kirschner, Wallace; Nambudiri, Easwaran C. N.; and Patterson, Douglas H., 4,706,215, Cl. 364-900.000.
Patterson, John H.; and Bernadic, Thomas J., to GTE Valenite. Scalloped polygonal cutting insert. 4,705,434, Cl. 407-114.000.
Paul, Albert P.; and Card, Roger J., to American Cyanamid Company. Method of manufacturing a bonded particulate article by reacting a polyol and a meterocyclic compound. 4,705,570, Cl. 106-124.000.
Paul Marienfeld KG: *See*—
Brose, Klaus, 4,705,705, Cl. 428-13.000.
Pawlowski, Michael: *See*—
Beebe, Cedric H.; McDavid, Larry S.; and Pawlowski, Michael, 4,705,617, Cl. 204-402.000.
Payne, Linda S.: *See*—
Boger, Joshua S.; and Payne, Linda S., 4,705,892, Cl. 562-562.000.
Payne, Peter, to Honeywell Inc. Sliding crank actuator. 4,704,912, Cl. 74-89.150.
Payne, William A., III, to American Telephone and Telegraph Co., AT&T Bell Labs. Switching system having multiple parallel switching networks. 4,706,240, Cl. 370-60.000.
Pease, Charles C.: *See*—
Raycher, Robert J.; and Pease, Charles C., 4,705,424, Cl. 403-266.000.
Pecis, John G.: *See*—
Carter, Robert J.; and Pecis, John G., 4,704,767, Cl. 16-388.000.
Pedigo, Michael K.: *See*—
Baker, William; Pedigo, Michael K.; Atkinson, Noel; and Shelton, Henry P., 4,706,274, Cl. 379-61.000.
Pedotti, Antonio; and Ferrigno, Giancarlo, to Fondazione Pro Juventute Don Carlo Gnocchi. Modularly expansible system for real time processing of a TV display, useful in particular for the acquisition of coordinates of known shape objects. 4,706,296, Cl. 382-42.000.
Pedro, Brian A.: *See*—
Sicard, Stephen T.; Pedro, Brian A.; and Alden, Wayne S., III, 4,705,333, Cl. 439-71.000.
Peerless Lighting Corporation: *See*—
Herst, Douglas J.; and Iwahashi, Henry H., 4,706,170, Cl. 362-217.000.
Peeters, Hendrikus W. J.; van Kuringen, Hendricus M. J. C.; and Hoeymakers, Gerardus M., to Oce-Nederland B.V. Method and device for controlling an image forming device. 4,705,391, Cl. 355-77.000.
Pelc, Norbert J.; and Glover, Gary H., to General Electric Company. Method for reducing image artifacts due to periodic signal variations in NMR imaging. 4,706,026, Cl. 324-309.000.
Pelletier, Yves: *See*—
Dumontet, Max; and Pelletier, Yves, 4,705,480, Cl. 439-33.000.
Penfound, Keith A.: *See*—
Kitchin, Jonathan P.; Powers, Stephen R.; Penfound, Keith A.; Finn, Peter J.; and Fisher, Michael G., 4,705,745, Cl. 430-505.000.
Penick, Joe E., to Mobil Oil Corporation. Catalytic reactor system with crosscurrent liquid and gasflow. 4,705,621, Cl. 208-146.000.
Penina-Surinach, Pere, to Hoechst Aktiengesellschaft. Biofouling side-stream apparatus (BSSA) for monitoring the microbial growth in oilfield water systems. 4,705,754, Cl. 435-287.000.
Penn, John E.: *See*—
Snelling, William E.; and Penn, John E., 4,706,210, Cl. 364-758.000.
Pennington, Donald W.: *See*—
Dighton, Gaylon L.; and Pennington, Donald W., 4,705,809, Cl. 521-62.000.
Pennwalt Corporation: *See*—
Georgiev, Vassil S.; and Mullen, George B., 4,705,891, Cl. 562-491.000.
Penta, Angelo D. Cheese handling apparatus. 4,705,470, Cl. 425-148.000.
Pepera, Marc A.: *See*—
Desmond, Michael J.; Pepera, Marc A.; and Callahan, James L., 4,705,675, Cl. 423-326.000.
Percival, William S.: *See*—
Willard, Reginald A.; and Percival, William S., 4,706,030, Cl. 324-322.000.
Perea, Bernabe A. Security and defense barrier. 4,705,426, Cl. 404-6.000.
Perkins, Dean P.: *See*—
Mueller, Allan H.; and Perkins, Dean P., 4,706,231, Cl. 367-190.000.
Perkins, Thomas K., to Atlantic Richfield Company. Method of cold water enhanced hydraulic fracturing. 4,705,113, Cl. 166-302.000.
Perkins, Warren E. Method and means for dispensing respirating gases by effecting a known displacement. 4,705,034, Cl. 128-204.210.
Perma Pure Products, Inc.: *See*—
Kertzman, Jack, 4,705,543, Cl. 55-158.000.
Perna, Dominic R., to Du Pont de Nemours, E. I., and Company. Polyimide covered calender rolls. 4,705,711, Cl. 428-141.000.
Perner, Johannes: *See*—
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,705,649, Cl. 260-402.000.
Persidsky, Maxim: *See*—
Borodulin, German; Persidsky, Maxim; and Shkolnik, Alexander, 4,705,029, Cl. 128-43.000.
Perten, Herbert; and Ambrose, William, to Johnson & Johnson Ultrasound, Inc. Photographic copier image contrast control. 4,706,131, Cl. 358-302.000.
Peters, Richard: *See*—
Crowe, David F.; Tanabe, Masato; and Peters, Richard, 4,705,783, Cl. 514-180.000.
Petersen, Alan B.: *See*—
Sheng, Shinan-Chur S.; Kaiser, Jeffrey; Jacobs, Ralph R.; and Petersen, Alan B., 4,706,256, Cl. 372-61.000.
Peterson, Carl. Chair lift with carrying case forming platform. 4,705,142, Cl. 182-150.000.
Petit, Herve : *See*—
Gadelle, Claude; and Petit, Herve , 4,705,431, Cl. 405-267.000.
Petty-Weeks, Sandra: *See*—
Polak, Anthony J.; and Petty-Weeks, Sandra, 4,705,545, Cl. 55-158.000.
Peyman, Gholam A.; and Grisolano, James M., Jr. Topographical mapping, depth measurement, and cutting systems for performing radial keratotomy and the like. 4,705,037, Cl. 128-305.000.
Pfaff Industriemaschinen GmbH: *See*—
Arbter, Conrad, 4,704,928, Cl. 83-175.000.
Pfizer Inc.: *See*—
Hunter, James R., 4,705,727, Cl. 428-653.000.
Wirth, Emil J., Jr., 4,705,261, Cl. 266-287.000.
Pfluger, Gerhard: *See*—
Franz, Herbert; and Pfluger, Gerhard, 4,705,983, Cl. 310-68.00D.

Pfohl, Robert L., to Vitacomm, Ltd. Vital signs monitoring system. 4,705,048, Cl. 128-715.000.

Pfutzenreuter, Henry: *See—*
Briggs, Jerald E.; and Pfutzenreuter, Henry, 4,705,708, Cl. 428-35.000.

Philips, Norbert J. L.: *See—*
Dijkmans, Eise C.; Raets, Joseph G. G.; and Philips, Norbert J. L., 4,706,035, Cl. 330-156.000.
Dijkmans, Eise C.; Raets, Joseph G. G.; and Philips, Norbert J. L., 4,706,039, Cl. 330-297.000.

Phillippot, Patrick: *See—*
Carle, Jean-Francois; and Phillippot, Patrick, 4,705,591, Cl. 156-617.0SP.

Phillips Petroleum Company: *See—*
Coombs, Daniel M.; Cymbaluk, Ted H.; Bertus, Brent J.; and Kukes, Simon G., 4,705,768, Cl. 502-213.000.
Howell, Jerald A.; and Kukes, Simon G., 4,705,766, Cl. 502-167.000.
Kolts, John H.; and Delzer, Gary A., 4,705,769, Cl. 502-241.000.
Kolts, John H.; and Delzer, Gary A., 4,705,772, Cl. 502-303.000.

Phillips, Roger W.: *See—*
Berning, Peter H.; and Phillips, Roger W., 4,705,300, Cl. 283-91.000.
Berning, Peter H.; and Phillips, Roger W., 4,705,356, Cl. 350-166.000.

Photoacoustic Technology, Inc.: *See—*
Arora, Arvind, 4,704,905, Cl. 73-596.000.

Piaa Corporation: *See—*
Kamaya, Masashi, 4,705,198, Cl. 224-329.000.

Picco, Andre , to Societe pour l'Etude et la Fabrication de Circuit Integres Speciaux-E.F.C.I.S. Arithmetic and logic unit with overflow indicator. 4,706,209, Cl. 364-745.000.

Pico-Glass S.p.A.: *See—*
Astolfi, Pietro, 4,704,814, Cl. 40-152.100.

Pienta, Lothar: *See—*
Mueller, Fritz; and Pienta, Lothar, 4,705,061, Cl. 137-269.000.

Piglia, Peter J.: *See—*
Cacioppo, Joseph C.; Wuerzer, Donald R.; and Piglia, Peter J., 4,705,976, Cl. 310-232.000.

Pike, August A.: *See—*
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,704,976, Cl. 112-262.200.

Pikkujamsa, Esa: *See—*
Hautala, Jouko; and Pikkujamsa, Esa, 4,705,631, Cl. 210-403.000.

Pintschovius, Ulrich: *See—*
Ohlendorf, Dieter; Hoffmann, Heinz; Interthal, Werner; and Pintschovius, Ulrich, 4,705,860, Cl. 546-347.000.

Pioneer Electronic Corporation: *See—*
Jinguji, Takumi, 4,706,134, Cl. 358-343.000.

Piper, William W.: *See—*
Possin, George E.; Parks, Harold G.; and Piper, William W., 4,704,783, Cl. 437-40.000.

Pirelli Coordinamento Pneumatici S.p.A.: *See—*
Ghilardi, Giuliano, 4,705,088, Cl. 152-209.00R.

Pismennaya, Galina: *See—*
Calabrese, Peter J.; and Pismennaya, Galina, 4,705,696, Cl. 427-14.100.

Pitney Bowes Inc.: *See—*
Arnoldi, Walter E., deceased; and Arnoldi, Walter E., administrator, 4,705,413, Cl. 400-56.000.
Hafner, Warren G., 4,706,159, Cl. 361-93.000.
Kirschner, Wallace; Nambudiri, Easwaran C. N.; and Patterson, Douglas H., 4,706,215, Cl. 364-900.000.
Smith, Lawrence J., 4,705,587, Cl. 156-321.000.

Plapp, Gunther; Zichner, Botho; Jautelat, Rudiger; Kohler, Rolf; Kratt, Alfred; and Muller, Hans-Martin, to Robert Bosch GmbH. Method of controlling tank venting in an internal combustion engine and apparatus therefor. 4,705,007, Cl. 123-519.00?

Plastic Specialties and Technologies, Inc.: *See—*
Radtke, Werner A.; and Roe, Joseph L., 4,704,778, Cl. 29-235.000.

Plath, Dieter: *See—*
Just, Christoph; Plath, Dieter; and Walz, Gerd, 4,705,885, Cl. 560-158.000.

Plessey Overseas Limited: *See—*
Komorowski, Robert B.; and Else, Mark, 4,705,477, Cl. 434-24.000.

Pleyers, Jozef J. A.: *See—*
Huntjens, Joseph M. J. E.; Kockelmans, Henricus G. J. M.; and Pleyers, Jozef J. A., 4,705,388, Cl. 355-15.000.

Podesta, Wolfgang: *See—*
Knochel, Arndt; Doscher, Burghard; and Podesta, Wolfgang, 4,705,635, Cl. 210-633.000.

Poeppel, Roger B.; Greenberg, Sherman; and Diercks, Dwight R., to United States of America, Energy. Methods and apparatus for reducing corrosion in refractory linings. 4,705,563, Cl. 75-95.000.

Poirier, Bruce A.: *See—*
Herdeg, Donald F.; and Poirier, Bruce A., 4,704,974, Cl. 112-121.120.

Poirier, Clovis; Banville, Marcel; McDonald, Mario; McDonald, Sabin; Johnston, Stephen; and Masson, Jean-Rene, to Ateliers Wood Inc. Baiting apparatus. 4,704,815, Cl. 43-4.000.

Polak, Anthony J.; and Petty-Weeks, Sandra, to UOP Inc. Thin film polymer blend membranes. 4,705,545, Cl. 55-158.000.

Poland, Robert L.: *See—*
Miller, Charles E.; Poland, Robert L.; and Yoshida, Louis T., 4,705,212, Cl. 236-54.000.

Pole, Ernest G.; and Carnell, David, to Polysar Limited. Liquid mulch. 4,705,816, Cl. 523-132.000.

Poloni, Alfredo; and Nonini, Geremia, to Danieli & C. Officine Meccanichi SpA. Procedure and device to feed a multiple-feed straightening machine automatically downstream of a cooling plate. 4,704,889, Cl. 72-428.000.

Polysar Limited: *See—*
Pole, Ernest G.; and Carnell, David, 4,705,816, Cl. 523-132.000.

Pongor, Sandor: *See—*
Cerami, Anthony; Pongor, Sandor; and Brownlee, Michael, 4,705,845, Cl. 530-305.000.

Porter, Richard M.: *See—*
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,704,976, Cl. 112-262.200.

Possin, George E.; Parks, Harold G.; and Piper, William W., to General Electric Company. Method for passivating the back channel of amorphous silicon field effect transistors. 4,704,783, Cl. 437-40.000.

Postler, Gunter: *See—*
Kratz, Bernhard; and Postler, Gunter, 4,704,965, Cl. 102-226.000.

Potier, Michel, to Valeo. Heat exchanger, in particular for a motor vehicle, having a rigid connection between a bundle of tubes and a water box and perforated plate assembly. 4,705,104, Cl. 165-149.000.

Pouget, Jacques; Lipovac, Vincent; and de Mauduit, Yves, to Borden, Inc. Method of working leather for the uppers of leather footwear. 4,705,586, Cl. 156-242.000.

Poulin, Benoit L., to Essex Group, Inc. Method of making and applying ethylene-propylene diene terpolymer texturized heat shrinkable tubing. 4,705,657, Cl. 264-22.000.

Powell, Walter W.: *See—*
McNeely, Michael D.; and Powell, Walter W., 4,705,065, Cl. 137-484.600.

Powers, Stephen R.: *See—*
Kitchin, Jonathan P.; Powers, Stephen R.; Penfound, Keith A.; Finn, Peter J.; and Fisher, Michael G., 4,705,745, Cl. 430-505.000.

Prescher, Guenter: *See—*
Deschler, Ulrich; Grund, Andreas; and Prescher, Guenter, 4,705,868, Cl. 549-215.000.

Pressaco, Pierre; and Sauvee, Jean-Paul, to Societe Anonyme D.B.A. Brake actuator with automatic adjustment. 4,705,147, Cl. 188-196.00D.

Presto Products, Incorporated: *See—*
Winter, John P., 4,705,707, Cl. 428-35.000.

Price, Steven C., to Standard Oil Company, The. Tetraploid corn and methods of production. 4,705,910, Cl. 800-1.000.

Primich, John V. Adjustable scraper. 4,704,795, Cl. 30-169.000.

Pritchard, Philip N. W., to Amphenol Corporation. Electrical connection devices for use with flat cable. 4,705,481, Cl. 439-417.000.

Processall, Inc.: *See—*
Shohet, Albert J., 4,705,222, Cl. 241-69.000.

Procter & Gamble Co., The: *See—*
Brand, Larry M.; and McDaniel, Harry C., 4,705,690, Cl. 426-590.000.
Kupper, Philip L.; and Morgan, Dan R., 4,705,691, Cl. 426-590.000.

Products Research & Chemical Corporation: *See—*
Kay, Carl J., 4,704,839, Cl. 52-732.000.

Prouty, Robert E.; and Cunningham, S. Michael, to Hamilton Standard Controls, Inc. Soft-contact solenoid contactor. 4,706,037, Cl. 335-248.000.

Pruchon, Philippe, to Cogema, Compagnie Generale des Matieres Nucleaires. Ventilation system for an isolation enclosure. 4,704,951, Cl. 98-1.500.

Puffer, Leroy G.; and Erf, Robert K., to United Technologies Corporation. Wire surface monitor. 4,705,957, Cl. 250-56.00B.

Punater, Dinesh G.: *See—*
Herman, John L.; Dessert, Robert A.; and Punater, Dinesh G., 4,705,199, Cl. 226-95.000.

Purvis, Michael J.: *See—*
Krechel, Joseph L.; Purvis, Michael J.; and Ross, Paul F., II, 4,705,076, Cl. 137-883.000.

Putnam, Milton T.; and Putnam, William L., to United Recording Electronic Industries. Coaxial loudspeaker system. 4,706,295, Cl. 381-156.000.

Putnam, William L.: *See—*
Putnam, Milton T.; and Putnam, William L., 4,706,295, Cl. 381-156.000.

Pylon Company, Inc.: *See—*
Sicard, Stephen T.; Pedro, Brian A.; and Alden, Wayne S., III, 4,705,333, Cl. 439-71.000.

Qayyum, Asif, to Advanced Micro Devices, Inc. Dual mode-increment/decrement N-bit counter register. 4,706,266, Cl. 377-33.000.

Quantex Corporation: *See—*
Lindmayer, Joseph, 4,705,952, Cl. 250-484.100.

Quinart, Pierre; Schoellhammer, Georges; Tableau, Pierre; and Vivien, Francois, to Machines Outils Wirth et Gruffat. Machine tool structure. 4,704,773, Cl. 29-27.00C.

Rabey, Alexander; and Hampel, Herbert J., to VIR, Inc. Patch module. 4,705,921, Cl. 200-50.00B.

Racchini, Loriano, to Ing. C. Olivetti & C., S.p.A. Apparatus for displaying images defined by a plurality of lines of data. 4,706,076, Cl. 340-726.000.

Rademacher, Wilhelm: *See*—
Buschmann, Ernst; Himmele, Walter; Eckhardt, Heinz; Ernst, Hansgeorg; Rademacher, Wilhelm; and Jung, Johann, 4,705,553, Cl. 71-76.000.

Radice, John G., to Universal Instruments Corporation. Selective gripping of inside and outside of articles. 4,705,313, Cl. 294-94.000.

Radisch, Helmer: *See*—
Frisch, Kurt C.; Klempner, Daniel; Radisch, Helmer; and Holzer, Gerhard, 4,705,721, Cl. 428-349.000.

Radtke, Werner A.; and Roe, Joseph L., to Plastic Specialties and Technologies, Inc. Valve mounting assembly for aerosol containers and the like. 4,704,778, Cl. 29-235.000.

Raets, Joseph G. G.: *See*—
Dijkmans, Eise C.; Raets, Joseph G. G.; and Philips, Norbert J. L., 4,706,035, Cl. 330-156.000.
Dijkmans, Eise C.; Raets, Joseph G. G.; and Philips, Norbert J. L., 4,706,039, Cl. 330-297.000.

Ragard, Phillip A., to Universal Instruments Corporation. Component pick and place spindle assembly with compact internal linear and rotary displacement motors and interchangeable tool assemblies. 4,705,311, Cl. 294-2.000.

Rahn, Eckhard F., to Miller Brewing Company. Keg cap. 4,705,188, Cl. 220-367.000.

Raidel, John E. Air suspension assembly with universal pivoted hanger bearings and rigid mount angular torque spring-beam. 4,705,294, Cl. 280-711.000.

Rainer, Alois; Ulbrich, Walter; and Gazsi, Lajos, to Siemens Aktiengesellschaft. Method and apparatus for reading samples of a time-dependent signal in a data processing system. 4,706,188, Cl. 364-200.000.

Ramachandran, Pallassana N.: *See*—
Barone, Patrizia; and Ramachandran, Pallassana N., 4,705,644, Cl. 252-135.000.

Ramco Oil Services: *See*—
Remp, Stephen E.; Ewen, Rodger M. H.; and Cumming, Norman S., 4,704,986, Cl. 118-318.000.

Ramsdale, Kurt A.; and Coffman, Keith E., to Simmonds Precision Products, Inc. Capacitive gauging method and apparatus. 4,706,203, Cl. 364-509.000.

Ramsey, Roswitha S.; and Todd, Richard A., to United States of America, Energy. Pulsed helium ionization detection system. 4,705,947, Cl. 250-386.000.

Ramsey, Roswitha S.; and Todd, Richard A., to United States of America, Energy. Closed-loop pulsed helium ionization detector. 4,705,948, Cl. 250-386.000.

Ranganath, Tirumala R., to Hughes Aircraft Company. Bipolar electrode scheme for electro-optic semiconductor waveguide devices. 4,706,103, Cl. 357-30.000.

Raoult, Jean-Jacques, to Compagnie Francaise des Petroles. Process for obtaining and processing seismic data measured at an exploratory well. 4,706,225, Cl. 367-57.000.

Rapoport, Morris, to Du Pont de Nemours, E. I., and Company. Continuous hydrocyanation process using zinc halide promoter. 4,705,881, Cl. 558-338.000.

Raquet, Jack W.: *See*—
Lim, Wah L.; Hauck, James P.; and Raquet, Jack W., 4,705,398, Cl. 356-350.000.

Ray, Thomas E. Rotary three-way plug valve. 4,705,075, Cl. 137-625.470.

Raychem Corporation: *See*—
Allen, Leslie J.; Cherian, Gabe; and Diaz, Stephen H., 4,705,205, Cl. 228-180.200.
Shen, Nelson M.; Moisson, Marc F.; Arrington, John P.; and Tayeb, AbdulMohamed, 4,705,347, Cl. 350-96.150.

Raycher, Robert J.; and Pease, Charles C., to KSM Fastening Systems Inc. Stud system for securing abrasion resistant members. 4,705,424, Cl. 403-266.000.

RCA Corporation: *See*—
Callen, Patrick J.; Bingley, John D.; and Newell, Richard A., 4,706,010, Cl. 323-225.000.
Fedele, Nicola J.; and Acampora, Alfonse A., 4,706,260, Cl. 375-27.000.
Kaganowicz, Grzegorz; Enstrom, Ronald E.; and Robinson, John W., 4,705,760, Cl. 437-234.000.
Rumreich, Mark F., 4,706,285, Cl. 380-14.000.
Toda, Minoru, 4,705,351, Cl. 350-96.180.
Tom, Edward; and McGovern, Douglas E., 4,706,069, Cl. 340-541.000.

Reaver, Phyllis E. Garment fastener attachment for brassiere strap. 4,704,745, Cl. 2-268.000.

Rebeschini, Michael E., to Motorola, Inc. Differential amplifier having ratioed load devices. 4,706,036, Cl. 330-253.000.

Reckitt & Colman Products Limited: *See*—
Dettmar, Peter W., 4,705,683, Cl. 424-81.000.

Recktenwald, Diether J.; Kerndt, Rickie S.; Loken, Michael R.; and Chen, Chia H., to Becton, Dickinson and Company. Method and materials for calibrating flow cytometers and other analysis instruments. 4,704,891, Cl. 73-1.00R.

Recordati S.A., Chemical and Pharmaceutical Company: *See*—
Nardi, Dante; Leonardi, Amedeo; Graziani, Gabriele; and Bianchi, Giorgio, 4,705,797, Cl. 514-356.000.

Redder, Manfred: *See*—
Grundken, Dieter; Redder, Manfred; and Schewinski, Hartmut, 4,705,160, Cl. 198-735.000.

Redpath, James: *See*—
Logan, Robert T.; Redpath, James; and Roy, Robert G., 4,705,782, Cl. 514-150.000.

Redpath, Thomas W. T.: *See*—
Edelstein, William A.; Hutchison, James M. S.; Johnson, Glyn; Redpath, Thomas W. T.; and Mallard, John R., 4,706,025, Cl. 324-309.000.

Reed, Gueary T., Jr., to Emerson Electric Co. Twist lock inverted T-rail clip. 4,705,255, Cl. 248-317.000.

Reed, Mark A.: *See*—
Frazier, Gary A.; Frensley, William R.; and Reed, Mark A., 4,705,361, Cl. 350-355.000.

Reedy, Robert P., to United States of America, Energy. Optical switch. 4,705,349, Cl. 350-96.150.

Reese, Norman W., to Dow Chemical Company, The. Steam trap muffler. 4,705,138, Cl. 181-212.000.

Reger, Arno: *See*—
Seeger, Gunter A.; and Reger, Arno, 4,705,922, Cl. 200-61.45M.

Regipa, Robert, to Centre National d'Etudes Spatiales (C.N.E.S.). Method and a device for hooking a balloon envelope to a fastener means. 4,705,235, Cl. 244-31.000.

Regulski, Thomas W.: *See*—
Kolb, Gerald C.; and Regulski, Thomas W., 4,705,872, Cl. 549-448.000.

Reichert, Karl-Heinz; Schoeppel, Wolfgang; Ewangelidis, Stawros; Bednarz, Jurgen; and Leute, Ulrich, to Siemens Aktiengesellschaft. Thermally conducting, electrically insulating thermoplastics. 4,705,648, Cl. 252-512.000.

Reilly, Kenneth B. Guitar having electro-luminescent light system. 4,704,941, Cl. 84-464.00A.

Reimann, Hans; and Wildmoser, Alfred, to Linde Aktiengesellschaft. Process and apparatus for the biological purification of wastewater. 4,705,634, Cl. 210-616.000.

Reimels, Harry G.; Walsh, David A.; and Arsenault, Michael J., to Mentor O & O, Inc. Ophthalmic aspirator-irrigator. 4,705,500, Cl. 604-35.000.

Reina, Leo J.; and Antolik, William J. Anti-scatter grid structure. 4,706,269, Cl. 378-154.000.

Rem Chemicals, Inc.: *See*—
Zobbi, Robert G.; and Michaud, Mark, 4,705,594, Cl. 156-637.000.

Remp, Stephen E.; Ewen, Rodger M. H.; and Cumming, Norman S., to Ramco Oil Services. Pipe cleaning or treating plant. 4,704,986, Cl. 118-318.000.

Renard, Georges: *See*—
Besson, Raymond; Delaite, Richard; Genestier, Gerard; Maitre, Pierre; Renard, Georges; Thiebaud, Daniel; and Valentin, Jean-Pascal, 4,705,982, Cl. 310-356.000.

Repella, James A., to Microdot Inc. Hydrodynamic seal. 4,705,277, Cl. 277-134.000.

Republic Steel Corporation: *See*—
Geer, Ralph D.; Morgan, Robert L.; and Senek, Dexter S., 4,705,260, Cl. 266-78.000.

Resch, James F., to ICI Americas Inc. Pyrazolo[3,4-b]pyrrolo[3,4-e]pyridine-5(1H)-one and 1-H-pyrazolo[3,4-b][1,6]naphthyridine-5(6H)-one derivations, useful as anti-anxiety agents. 4,705,793, Cl. 514-293.000.

Research-Cottrell, Inc.: *See*—
Stackhouse, David W.; and Heidl, Stephen C., 4,705,653, Cl. 261-111.000.

Research Development Corporation of Japan: *See*—
Matsumoto, Satoshi, 4,705,764, Cl. 502-62.000.

Resnick, Joseph A.: *See*—
Torgeson, W. Lee, 4,706,292, Cl. 381-70.000.

Ressel, Herbert; and Westphal, Wilhelm, to Hoechst Aktiengesellschaft. Apparatus for reducing iron and vanadium in phosphoric acid solution. 4,705,671, Cl. 422-189.000.

Restelli, Edward F., Jr.: *See*—
Cullo, Leonard A.; Nagle, Elliott V., Jr.; Restelli, Edward F., Jr.; and Yogan, Thomas J., 4,705,770, Cl. 502-242.000.

Rettew, Stephen: *See*—
Kaltenbach, Karl W.; Rettew, Stephen; Rudy, John O.; and Szakacs, Gabor L., 4,705,668, Cl. 422-82.000.

Reuther, Christian: *See*—
Fleischer, Klaus; Gohler, Peter; Mangler, Rolf; Reuther, Christian; Schingnitz, Manfred; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir; Fedotov, Vasilij; and Rodionov, Boris, 4,704,971, Cl. 110-264.000.

Rhone-Poulenc Chimie: *See*—
Millet, Claude; and Rostaing, Paul, 4,705,810, Cl. 521-86.000.

Rhone-Poulenc Sante: *See*—
Mignani, Gerard; and Morel, Didier, 4,705,650, Cl. 260-405.500.

Ribbon Technology Corporation: *See*—
Gaspar, Thomas A., 4,705,095, Cl. 164-463.000.

Rice, Larry: *See*—
Kaya, Azmi; and Rice, Larry, 4,704,805, Cl. 34-31.000.

Richardson, Dean L.: *See*—
Gibson, Phillip R.; and Richardson, Dean L., 4,704,817, Cl. 43-57.300.

Richardson, Neil, to Fairchild Camera and Instrument Corporation. Electron beam test probe system for analyzing integrated circuits. 4,706,019, Cl. 324-158.00R.

Richardson-Vicks Limited: *See*—
Maes, Daniel; and Brudney, Norman, 4,705,681, Cl. 424-70.000.

Richter, Hans-Peter, to Robert Bosch GmbH. Apparatus for decoding a PAL standard color television signal. 4,706,110, Cl. 358-19.000.
Richter, Reinhard: *See—*
Tanner, Herbert; Bertram, Heidrun-Leonore; Richter, Reinhard; and Spindler, Manfred, 4,705,689, Cl. 426-2.000.
Ricoh Company, Ltd.: *See—*
Hagiri, Minoru, 4,705,774, Cl. 503-207.000.
Kondo, Mitsuru, 4,706,126, Cl. 358-257.000.
Ricoh Corporation: *See—*
Suzuki, Shigeru, 4,706,099, Cl. 346-160.000.
Ridgway, Steve H. Trailer for storing and drying harvested crops. 4,704,807, Cl. 34-201.000.
Rieter Scragg Limited: *See—*
Naylor, Geoffrey; and Wilkinson, Philip M., 4,704,858, Cl. 57-340.000.
Rinz, James E.: *See—*
Cesa, Mark C.; Rinz, James E.; and Kopp, Teodora T., 4,705,864, Cl. 548-309.000.
Ripberger, Emil; Stuska, Gotthard; and Ulrich, Reiner, to Mahle GmbH. Plunger piston for internal combustion engines. 4,704,950, Cl. 92-208.000.
Ripley, David R.: *See—*
Rocco, Art; and Ripley, David R., 4,704,901, Cl. 73-146.800.
Ritter, Robert E.: *See—*
DuPont, Preston S.; Ritter, Robert E.; and Stafford, John P., 4,705,646, Cl. 252-511.000.
Ritzinger, Georg, to Voest-Alpine Automotive Gesselschaft. Synchro-generator. 4,705,975, Cl. 310-162.000.
Rivoli, Anthony L.: *See—*
Gimpelson, George E.; Holbrook, Cheryl L.; and Rivoli, Anthony L., 4,705,597, Cl. 156-643.000.
RJS Enterprises, Inc.: *See—*
Ulinski, Richard J., Sr., 4,705,939, Cl. 235-466.000.
Robert Bosch GmbH: *See—*
Franz, Herbert; and Pfluger, Gerhard, 4,705,983, Cl. 310-68.00D.
Graser, Franz; Langer, Werner; and Nowak, Reiner, 4,705,210, Cl. 239-585.000.
Guntert, Josef; Hafele, Walter; and Tschoke, Helmut, 4,705,005, Cl. 123-500.000.
Mannle, Erik; and Bauer, Peter-Josef, 4,706,062, Cl. 338-172.000.
Plapp, Gunther; Zichner, Botho; Jautelat, Rudiger; Kohler, Rolf; Kratt, Alfred; and Muller, Hans-Martin, 4,705,007, Cl. 123-519.000.
Richter, Hans-Peter, 4,706,110, Cl. 358-19.000.
Roberts, Allen M.; Sangster, Andrew; and Stroll, Zoltan, to Xerox Corporation. Halftoning implementation for interactive image editing. 4,706,077, Cl. 340-728.000.
Roberts, Ronald R. Fence installation apparatus. 4,705,262, Cl. 256-37.000.
Roberts, William J., to Allied Corporation. Power limiter for electrical contacts. 4,706,151, Cl. 361-6.000.
Robertson, Albert W., to Air Stamping, Inc. Bearer wiper assembly. 4,704,964, Cl. 101-425.000.
Robertson, Gerald F.: *See—*
Zogg, Robert A.; Robertson, Gerald F.; and Brown, Will C., 4,705,103, Cl. 165-110.000.
Robertson, Ian M., to Channelwood Preservations Ltd. Drill jig. 4,705,436, Cl. 408-72.00R.
Robeson, Lloyd M.: *See—*
Kawakami, James H.; Harris, James E.; Maresca, Louis M.; Robeson, Lloyd M.; and Cotter, Robert J., 4,705,822, Cl. 524-425.000.
Robidoux, Richard R.; and Hoverman, Ronald B., to Northern Telecom Limited. Data recovery and clock circuit for use in data test equipment. 4,706,033, Cl. 328-139.000.
Robillard, Jean J. A. Device for the qualitative measurement of uv radiation received by the skin. 4,705,046, Cl. 128-665.000.
Robings, Kenneth W., to Clairmont Camera, Inc. Tilting viewfinder and video door accessory for motion-picture camera. 4,705,374, Cl. 354-225.000.
Robinson, E. Howell, Jr., to Chase Instruments Corporation. Test tube making and end coating. 4,705,551, Cl. 65-60.100.
Robinson, James L., to Fulflo Specialties Co., Inc., The. Motor operated valve assembly. 4,705,063, Cl. 137-315.000.
Robinson, John W.: *See—*
Kaganowicz, Grzegorz; Enstrom, Ronald E.; and Robinson, John W., 4,705,760, Cl. 437-234.000.
Robol, Ronald B.: *See—*
Weir, Donald H.; Frederick, Stanley H.; Hotaling, Robert A.; and Robol, Ronald B., 4,705,629, Cl. 210-340.000.
Roboter GmbH: *See—*
Hartmann, Georg; Wiedemann, Kurt; and Zimmer, Ernst, 4,705,243, Cl. 248-51.000.
Rocco, Art; and Ripley, David R., to Neotech Industries, Inc. Tire pressure gauge. 4,704,901, Cl. 73-146.800.
Rock, Erich; and Hollenstein, Helmut, to Julius Blum Gesellschaft m.b.H. Mounting device for front members of drawers. 4,705,328, Cl. 312-330.00R.
Rockefeller University: *See—*
Cerami, Anthony; Pongor, Sandor; and Brownlee, Michael, 4,705,845, Cl. 530-305.000.
Rockwell International Corporation: *See—*
Kinoshita, Roy Y.; McCollum, Patrick E.; and Colan, Mark E., 4,705,962, Cl. 307-247.100.
Spence, John R., 4,706,220, Cl. 365-203.000.
Watson, George A.; Co, Ramon S.; Fuhrman, James L.; and Avella, Frank, 4,706,244, Cl. 370-69.100.
Rodebaugh, Jimmy L.; and Rodebaugh, Onetta R. Cover for outdoor table and benches. 4,705,084, Cl. 150-52.00R.
Rodebaugh, Onetta R.: *See—*
Rodebaugh, Jimmy L.; and Rodebaugh, Onetta R., 4,705,084, Cl. 150-52.00R.
Rodionov, Boris: *See—*
Fleischer, Klaus; Gohler, Peter; Mangler, Rolf; Reuther, Christian; Schingnitz, Manfred; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir; Fedotov, Vasilij; and Rodionov, Boris, 4,704,971, Cl. 110-264.000.
Roe, Joseph L.: *See—*
Radtke, Werner A.; and Roe, Joseph L., 4,704,778, Cl. 29-235.000.
Roeland, Robert: *See—*
Grimes, Thomas L.; Roeland, Robert; and Schadewald, Frederic H., 4,705,611, Cl. 204-129.100.
Rogers Corporation: *See—*
Hernandez, Jorge M.; and Gilderdale, Aleta, 4,706,162, Cl. 361-306.000.
Rohm GmbH Chemische Fabrik: *See—*
Lehmann, Klaus; Dreher, Dieter; and Goetz, Harry, 4,705,695, Cl. 427-3.000.
Rohm and Haas Company: *See—*
Nichols, Richard W.; Zabrodski, William J.; and Mitra, Abhijit, 4,705,902, Cl. 568-810.000.
Rohm, Robert F.; and Bushman, Ronald C., to Brown International Corporation. Apparatus for automatically cleaning extrusion screens in juice finishing machines and the like. 4,705,055, Cl. 134-57.00R.
Rohr Industries, Inc.: *See—*
Norris, Brian, 4,705,207, Cl. 228-194.000.
Rollin, Jean: *See—*
Lauzier, Rene; Rollin, Jean; Choquelle, Jean; Dumas, Gerard; Breat, Francois; Rousson, Maurice; and Defour, Paule, 4,705,286, Cl. 280-281.00R.
Romed Corporation: *See—*
Conrad, Rodney W., 4,704,910, Cl. 73-863.210.
Rona, Mehmet, to Arthur D. Little, Inc. Voltage tunable coherent light source. 4,706,251, Cl. 372-4.000.
Rosboch, Luciano: *See—*
Astegiano, Luciano; Bertoglio, Ottavio; Bosco, Fulvio; de Bosio, Alfredo; Franco, Dario; Lampiano, Piero; Melle, Antonio; and Rosboch, Luciano, 4,706,270, Cl. 379-2.000.
Rosenberg, Helmut W. G., to Kendall Company, The. Nephrostomy catheter with formed tip. 4,705,510, Cl. 604-280.000.
Rosenblatt, Arnold: *See—*
Black, Stephen J.; Hitzigrath, Richard; Rosenblatt, Arnold; and Grundy, Douglas H., 4,705,100, Cl. 165-40.000.
Rosenfeld, John. Cat box litter and process for producing same. 4,704,989, Cl. 119-1.000.
Rosier, Brian K.: *See—*
Pan, David S.; Sarma, Kanak C.; Halfacre, Mark A.; Owens, Alexander H.; and Rosier, Brian K., 4,706,102, Cl. 357-23.500.
Ross Daniels, Inc.: *See—*
Daniels, Jay S., 4,705,218, Cl. 239-271.000.
Ross, James M.: *See—*
Churchill, Thomas L.; and Ross, James M., 4,704,906, Cl. 73-660.000.
Ross, Paul F., II: *See—*
Krechel, Joseph L.; Purvis, Michael J.; and Ross, Paul F., II, 4,705,076, Cl. 137-883.000.
Rossetti, Edoardo, to Corob S.R.L. Automatic Machinery Project. Method and machine for batching coloring agents into paints and varnishes. 4,705,083, Cl. 141-104.000.
Rostaing, Paul: *See—*
Millet, Claude; and Rostaing, Paul, 4,705,810, Cl. 521-86.000.
Rothon, Stephen: *See—*
Johnson, Jeffrey C.; Rothon, Stephen; and Slater, Andrew J., 4,704,952, Cl. 98-115.200.
Rotola, Louis A., Jr.; and Laing, Gordon E., to Singer Company, The. Dirt drawer latch for vacuum cleaner. 4,705,547, Cl. 55-374.000.
Rottapharm S.p.A.: *See—*
Desideri, Derio; Stradi, Riccardo; and Milanese, Alberto, 4,705,855, Cl. 544-370.000.
Rousson, Maurice: *See—*
Lauzier, Rene; Rollin, Jean; Choquelle, Jean; Dumas, Gerard; Breat, Francois; Rousson, Maurice; and Defour, Paule, 4,705,286, Cl. 280-281.00R.
Rowan, Timothy M.: *See—*
Kerkman, Russel J.; and Rowan, Timothy M., 4,706,012, Cl. 323-280.000.
Roy, Robert G.: *See—*
Logan, Robert T.; Redpath, James; and Roy, Robert G., 4,705,782, Cl. 514-150.000.
Royer, Daniel R.: *See—*
Dieulesaint, Eugene J.; and Royer, Daniel R., 4,706,046, Cl. 331-155.000.
Rozansky, Boris: *See—*
Midland, Richard W.; and Rozansky, Boris, 4,706,116, Cl. 358-67.000.
Rubbermaid Commercial Products, Inc.: *See—*
Delmerico, Paul E., 4,705,247, Cl. 248-98.000.
Rubinstein, Mordecai, to Nordson Corporation. Spray gun mover. 4,704,985, Cl. 118-316.000.
Rubloff, Gary W.: *See—*
Behs, Johannes G.; Dreyfus, Russell W.; and Rubloff, Gary W., 4,706,018, Cl. 324-158.00R.

Rudolph, Peter K. C., to Boeing Company, The. Aileron system for aircraft and method of operating the same. 4,705,236, Cl. 244-90.00R.
Rudy, John O.: *See*—
Kaltenbach, Karl W.; Rettew, Stephen; Rudy, John O.; and Szakacs, Gabor L., 4,705,668, Cl. 422-82.000.
Ruiz-Ontiveros, Saul R.: *See*—
Canales-Santos, Enrique; Carro-de-la-Fuente, Guillermo; and Ruiz-Ontiveros, Saul R., 4,705,550, Cl. 65-32.000.
Rule, Mark: *See*—
Steinmetz, Guy R.; and Rule, Mark, 4,705,890, Cl. 562-406.000.
Rummel, Peter; and Wolfgang, Eckhard, to Siemens Aktiengesellschaft. Method and apparatus for automatically positioning a particle beam. 4,705,954, Cl. 250-491.100.
Rumreich, Mark F., to RCA Corporation. Automatic gain control of a scrambled video signal. 4,706,285, Cl. 380-14.000.
Rung, Robert, to Victaulic Company of America. Flow metering sight glass. 4,704,983, Cl. 116-276.000.
Rupprecht, Christian. Item of sports equipment or games device. 4,705,272, Cl. 272-146.000.
Rusterholz, John T.: *See*—
Hamstra, James R.; Koehler, Howard A.; Rusterholz, John T.; and Tanglin, David J., 4,706,191, Cl. 364-200.000.
Ruterbusch, Paul H., to General Electric Company. Containment shield for a replaceable xenon lamp and reflector module. 4,706,171, Cl. 362-254.000.
Ryan, Frederick M.; Gottlieb, Milton; and Feldman, Donald W., to Westinghouse Electric Corp. Acousto-optic tunable filter with two acoustic channels. 4,705,362, Cl. 350-372.000.
Ryan, Kenneth J.: *See*—
Acton, Edward M.; Ryan, Kenneth J.; and Tracy, Michael, 4,705,850, Cl. 536-1.100.
Ryobi Ltd.: *See*—
Maruyama, Kenji; and Kobayashi, Takehiro, 4,705,228, Cl. 242-84.20G.
Saake, James T.: *See*—
Harbolt, Bruce; Saake, James T.; and Jackson, Douglas J., 4,705,432, Cl. 406-60.000.
Sackett, Robert W.: *See*—
Schutten, Herman P.; Sackett, Robert W.; Sedivy, Jan K.; and Taken, Michael E., 4,706,174, Cl. 363-9.000.
Schutten, Herman P.; Sackett, Robert W.; Sedivy, Jan K.; and Taken, Michael E., 4,706,175, Cl. 363-9.000.
Schutten, Herman P.; Sackett, Robert W.; Sedivy, Jan K.; and Taken, Michael E., 4,706,183, Cl. 363-157.000.
Schutten, Herman P.; Sackett, Robert W.; Sedivy, Jan K.; and Taken, Michael E., 4,706,184, Cl. 363-157.000.
Sacks, Dieter; and Monch, Hans, to Interpat Limited. Wringer for mops and the like. 4,704,763, Cl. 15-262.000.
Sadamasa, Tetsuo: *See*—
Nakamura, Masaru; Okajima, Masaki; Komatsubara, Tadashi; Sadamasa, Tetsuo; and Nitta, Koichi, 4,706,101, Cl. 357-17.000.
Sadao, Ando; and Satoshi, Saito, to Yamatake-Honeywell Co., Ltd. Switch mounting device. 4,705,241, Cl. 248-27.300.
Sadigh-Behzadi, Amir-Akbar, to Criton Technologies. High density, controlled impedance connectors. 4,705,332, Cl. 439-69.000.
Saenz, Jesus A.: *See*—
Kummer, David A.; Saenz, Jesus A.; and Trynosky, Stephen W., 4,706,079, Cl. 340-799.000.
Sagami Chemical Research Center: *See*—
Matsumoto, Masakatsu; and Nishimura, Yasunobu, 4,705,884, Cl. 560-109.000.
Sahlberg, Agge. Anchor arranged for lowering along an inclined plane. 4,704,982, Cl. 114-304.000.
Sahm, Michael K.; and Milano, Robert, to United Technologies Corporation. Convergent-divergent film coolant passage. 4,705,455, Cl. 416-97.00R.
Sahrbacker, Edward V., to Lucerne Products, Inc. Electrical switch with rocker actuator having removable locking key. 4,705,920, Cl. 200-43.040.
Sainomoto, Yoshinori; and Maekawa, Nobuteru, to Matsushita Electric Works Ltd. Leakage detecting device for electrical appliance. 4,706,153, Cl. 361-42.000.
Saint-Gobain Vitrage: *See*—
Frisch, Kurt C.; Klempner, Daniel; Radisch, Helmer; and Holzer, Gerhard, 4,705,721, Cl. 428-349.000.
St. Laurent, Wilfred; and Athanassiu, Christos, to Bellofram Corporation. Fluid operated pump. 4,705,458, Cl. 417-46.000.
Saito, Katsuyuki: *See*—
Kato, Shinichi; Sasaki, Masahiko; Kato, Tadashi; Kanno, Masahide; Takahashi, Yutaka; and Saito, Katsuyuki, 4,706,118, Cl. 358-98.000.
Saito, Keichiro: *See*—
Itaba, Yasushi; Saito, Keichiro; Tabuchi, Jyoichi; and Yoshizawa, Masao, 4,705,714, Cl. 428-215.000.
Saito, Koji: *See*—
Shimada, Masaaki; Saito, Koji; and Midorikawa, Yoshiaki, 4,705,702, Cl. 427-180.000.
Saito, Yasuhisa; Takagishi, Hisao; Watanabe, Katsuya; Okuno, Kohichi; Kenmei, Junichi; and Kamio, Kunimara, to Sumitomo Chemical Company, Limited. Thermosettable heat-resistant resin compositions. 4,705,833, Cl. 525-504.000.
Saito, Yoshihiko: *See*—
Niwa, Kensuke; Fujita, Hisayoshi; Saito, Yoshihiko; Makihara, Hiroshi; Hashimoto, Ritsuo; Hoshi, Younosuke; and Murayama, Katsutoshi, 4,705,654, Cl. 261-128.000.
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, to Canon Kabushiki Kaisha. Light-receiving member. 4,705,730, Cl. 430-57.000.
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, to Canon Kabushiki Kaisha. Member having substrate with protruding surface light receiving layer of amorphous silicon and surface reflective layer. 4,705,731, Cl. 430-57.000.
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, to Canon Kabushiki Kaisha. Member having substrate with projecting portions at surface and light receiving layer of amorphous silicon. 4,705,732, Cl. 430-57.000.
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, to Canon Kabushiki Kaisha. Member having light receiving layer and substrate with overlapping subprojections. 4,705,733, Cl. 430-57.000.
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, to Canon Kabushiki Kaisha. Member having substrate with irregular surface and light receiving layer of amorphous silicon. 4,705,734, Cl. 430-57.000.
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, to Canon Kabushiki Kaisha. Member having substrate with protruding surface portions and light receiving layer with amorphous silicon matrix. 4,705,735, Cl. 430-57.000.
Sakagami, Atsushi: *See*—
Suzuki, Tadashi; Tomikashi, Minoru; Futami, Toru; and Sakagami, Atsushi, 4,706,245, Cl. 370-85.000.
Sakaguchi, Ushio; Nakano, Masahiro; and Uchida, Mitsukuni, to Takasago Medical Industry, Co., Ltd. Subsidiary device for suturing an intestine. 4,705,039, Cl. 128-334.00C.
Sakai, Haruo; and Hiejima, Kiyoshi, to Sanyo Electric Co., Ltd. Electronic control cooking apparatus. 4,705,926, Cl. 219-10.55B.
Sakai, Kohzo: *See*—
Hayashi, Atsushi; Kuwabara, Kiyoharu; Sakai, Kohzo; and Ishino, Toshihiro, 4,705,763, Cl. 501-103.000.
Sakakibara, Hiroyuki: *See*—
Yoshino, Yasuhisa; Kago, Yoshiyuki; Sakakibara, Hiroyuki; and Shinoda, Yoshio, 4,706,195, Cl. 364-426.000.
Sakakibara, Shinsuke: *See*—
Kishi, Hajimu; Sakakibara, Shinsuke; Ishikawa, Haruyuki; and Kanda, Yuuichi, 4,706,000, Cl. 318-568.000.
Nakashima, Seiichiro; Toyoda, Kenichi; and Sakakibara, Shinsuke, 4,706,003, Cl. 318-568.000.
Sakakibara, Shuji: *See*—
Matsumura, Toshimi; Sumitani, Shinya; Hayakawa, Takahiro; Hasegawa, Takashi; and Sakakibara, Shuji, 4,705,000, Cl. 123-357.000.
Sakakibara, Yasuo: *See*—
Nomura, Etsuzo; Kozawa, Tetsuo; and Sakakibara, Yasuo, 4,704,978, Cl. 112-275.000.
Sakakibara, Yasuyuki; Abe, Seiko; Tomita, Masahiro; Yorita, Hiroshi; Tanaka, Takeshi; and Igashira, Toshihiko, to Nippon Soken, Inc. Apparatus for controlling electroexpansive actuator avoiding deterioration of polarization. 4,705,003, Cl. 123-449.000.
Sakaya, Kazuyuki: *See*—
Miwa, Kishio; Kihara, Makoto; Sakaya, Kazuyuki; and Inoue, Takehisa, 4,705,627, Cl. 210-264.000.
Sakurada, Nobuaki: *See*—
Takayama, Makoto; and Sakurada, Nobuaki, 4,706,132, Cl. 358-336.000.
Salamon, Ernst: *See*—
Kern, Otto; Wilhelm, Franz; and Salamon, Ernst, 4,705,803, Cl. 514-450.000.
Sameshima, Tadashi: *See*—
Yamamoto, Yuichi; and Sameshima, Tadashi, 4,705,628, Cl. 210-289.000.
Sampson, Peter F.: *See*—
Palm, Charles S.; Slayton, Danny L.; Lak, Khosrow; Sampson, Peter F.; Davis, David R.; Wheatley, Maurice S., Jr.; Chatham, Gregory A.; Jones, Wayne C.; Charles, Kirk W.; and Ireland, Anthony J., 4,705,385, Cl. 355-4.000.
Samuelsson, Soren. Self-erecting tripod apparatus. 4,705,251, Cl. 248-171.000.
Sanden Corporation: *See*—
Koitabash, Takatoshi, 4,705,973, Cl. 310-78.000.
Sanders Associates, Inc.: *See*—
Guy, Jon S.; Liu, Dean-Yuan; and Sholtis, Albert A., 4,705,414, Cl. 400-120.000.
Sanderson, John R.; and Larkin, John M., to Texaco Inc. Catalytic decomposition of impurities in tertiary butyl alcohol. 4,705,903, Cl. 568-922.000.
Sanderson, Robert A.; and Crosby, Gaius P., to James, Thomas A. Concealed hinge for lightweight safes. 4,704,970, Cl. 109-73.000.
Sangster, Andrew: *See*—
Roberts, Allen M.; Sangster, Andrew; and Stroll, Zoltan, 4,706,077, Cl. 340-728.000.
Sani-Fresh International, Inc.: *See*—
Bokmiller, David J.; and Heck, Samuel C., 4,705,420, Cl. 401-145.000.
Heck, Samuel C., 4,705,195, Cl. 222-207.000.
Santrade Limited: *See*—
Hedlund, Jan-Gunnar, 4,705,321, Cl. 299-81.000.
Sanyo Electric Co., Ltd.: *See*—
Nakashima, Yukio; Haku, Hisao; Watanabe, Kaneo; and Matsuoka, Tsugufumi, 4,705,912, Cl. 136-258.000.

Sakai, Haruo; and Hiejima, Kiyoshi, 4,705,926, Cl. 219-10.55B.
Sanyo Special Steel: *See*—
Kudo, Yasuichi, 4,706,022, Cl. 324-243.000.
Saotome, Kaoru; Sasaki, Hiroyuki; and Kanbara, Katsuhiro, to Toyota Jidosha Kabushiki Kaisha; Nihon Sekiso Kogyo; and Maruyasu Industries Co., Ltd. Tube protecting device. 4,705,244, Cl. 248-68.100.
Sapper, Rainer, to Linde Aktiengesellschaft. Separation of C_{3+} hydrocarbons by absorption and rectification. 4,705,549, Cl. 62-30.000.
Sara Lee Corporation: *See*—
Howard, Fred; and Edson, Sydney, 4,705,175, Cl. 211-59.200.
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,704,976, Cl. 112-262.200.
Saraga, Pepe. Earring. 4,704,878, Cl. 63-14.00R.
Sarma, Kanak C.: *See*—
Pan, David S.; Sarma, Kanak C.; Halfacre, Mark A.; Owens, Alexander H.; and Rosier, Brian K., 4,706,102, Cl. 357-23.500.
Sasage, Tsutomu; Matsumoto, Minoru; and Yoshikawa, Toru, to NEC Corporation. Sheet convey device. 4,705,266, Cl. 271-264.000.
Sasaki, Hiroyuki: *See*—
Saotome, Kaoru; Sasaki, Hiroyuki; and Kanbara, Katsuhiro, 4,705,244, Cl. 248-68.100.
Sasaki, Makoto: *See*—
Takatsu, Haruyoshi; Sasaki, Makoto; Tanaka, Yasuyuki; and Sato, Hisato, 4,705,870, Cl. 549-369.000.
Takatsu, Haruyoshi; Sasaki, Makoto; Tanaka, Yasuyuki; and Sato, Hisato, 4,705,905, Cl. 585-25.000.
Sasaki, Masahiko: *See*—
Kato, Shinichi; Sasaki, Masahiko; Kato, Tadashi; Kanno, Masahide; Takahashi, Yutaka; and Saito, Katsuyuki, 4,706,118, Cl. 358-98.000.
Sasaki, Masahiro: *See*—
Fujii, Tadashi; Yagami, Hiroyuki; Seo, Iwao; and Sasaki, Masahiro, 4,704,774, Cl. 29-25.350.
Sasaki, Noboru; and Takahashi, Koji, to Fuji Photo Film Co., Ltd. Color photographic materials having red color saturation and improved discrimination of green colors. 4,705,744, Cl. 430-505.000.
Sasano, Akiyoshi: *See*—
Hara, Kazumasa; Sasano, Akiyoshi; and Koike, Mikio, 4,704,975, Cl. 112-238.000.
Sasser, R. Garth; and Hamilton, William C., to Idaho Research Foundation, Inc. Antigen associated with early detection of mammalian pregnancy. 4,705,748, Cl. 435-7.000.
Sastra, Budiman: *See*—
Dohmen, Gerardus M.; Fijnvandraat, Jacob G.; and Sastra, Budiman, 4,706,146, Cl. 360-122.000.
Sathre, Curtis J., Jr.; and Thornton, Mark R., to Duncan Enterprises. Heating control apparatus. 4,705,930, Cl. 219-492.000.
Sato, Hiromitsu: *See*—
Hibino, Yoshitaka; Fukuzawa, Takeshi; Sato, Hiromitsu; and Asakura, Masahiko, 4,705,011, Cl. 123-589.000.
Sato, Hisato: *See*—
Takatsu, Haruyoshi; Sasaki, Makoto; Tanaka, Yasuyuki; and Sato, Hisato, 4,705,870, Cl. 549-369.000.
Takatsu, Haruyoshi; Sasaki, Makoto; Tanaka, Yasuyuki; and Sato, Hisato, 4,705,905, Cl. 585-25.000.
Sato, Isao: *See*—
Iizuka, Nobuyuki; Hirose, Fumiyuki; Sato, Isao; and Ishibashi, Yoji, 4,704,869, Cl. 60-751.000.
Sato, Kozo: *See*—
Hirai, Hiroyuki; Sato, Kozo; Yabuki, Yoshiharu; and Kawata, Ken, 4,705,737, Cl. 430-203.000.
Sato, Kunihiko: *See*—
Takahashi, Hiroshi; Tamura, Masanobu; and Sato, Kunihiko, 4,705,004, Cl. 123-491.000.
Sato, Shigeru: *See*—
Arai, Yoshinao; Takahashi, Shino; Oikawa, Eigo; Sato, Shigeru; and Kobayashi, Hideaki, 4,706,187, Cl. 364-191.000.
Sato, Tadahisa; Kawagishi, Toshio; and Furutachi, Nobuo, to Fuji Photo Film Co., Ltd. Process for producing pyrazolo[1,5-b][1,2,4]triazole derivatives. 4,705,863, Cl. 548-262.000.
Sato, Yo, to Kabushiki Kaisha Sato. Unit type thermal label printer. 4,706,096, Cl. 346-76.0PH.
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Sattlegger, Hans: *See*—
Weber, Wilhelm; Sockel, Karl H.; Achtenberg, Theo; and Sattlegger, Hans, 4,705,826, Cl. 524-860.000.
Sauvage, Michel: *See*—
Cransac, Jean-Pierre; Jogand, Patrick; and Sauvage, Michel, 4,705,661, Cl. 376-206.000.
Sauvee, Jean-Paul: *See*—
Pressaco, Pierre; and Sauvee, Jean-Paul, 4,705,147, Cl. 188-196.00D.
Saveliev, Vyacheslav N.: *See*—
Kostylev, Alexandr D.; Danilov, Boris B.; Smolyanitsky, Boris N.; Boginsky, Vladimir P.; Kogan, David I.; Smirnov, Oleg V.; and Saveliev, Vyacheslav N., 4,705,119, Cl. 175-92.000.
Sawchuk, Ronald R. Doorway security system. 4,705,309, Cl. 292-342.000.
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Grimes, Thomas L.; Roeland, Robert; and Schadewald, Frederic H., 4,705,611, Cl. 204-129.100.
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Schafer, Paul: *See*—
Abel, Heinz; Schafer, Paul; and Berendt, Hans-Ulrich, 4,705,525, Cl. 8-555.000.
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Ganser, Hans G.; Kersten, Reinhard; Schafer, Rolf; and Stormberg, Hans P., 4,705,991, Cl. 315-209.00R.
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Schaub, Heiner; and Burki, Peter, to Gretag Aktiengesellschaft. Process and apparatus for treating objects forming separate series. 4,705,376, Cl. 354-298.000.
Scheffer, Terry J.: *See*—
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Biere, Helmut, 4,705,856, Cl. 546-21.000.
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Grundken, Dieter; Redder, Manfred; and Schewinski, Hartmut, 4,705,160, Cl. 198-735.000.
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Schingnitz, Manfred: *See*—
Fleischer, Klaus; Gohler, Peter; Mangler, Rolf; Reuther, Christian; Schingnitz, Manfred; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir; Fedotov, Vasilij; and Rodionov, Boris, 4,704,971, Cl. 110-264.000.
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Sinha, Bikash K., 4,705,979, Cl. 310-313.00A.
Wagoner, Joseph L. C., 4,705,353, Cl. 350-96.230.
Schmidt, Adolf: *See*—
Hendricks, Udo W.; and Schmidt, Adolf, 4,705,889, Cl. 562-564.000.
Schmidt, Harald H., to Mold-Masters Limited. Dual feed bushing for multi-cavity injection molding. 4,705,473, Cl. 425-549.000.
Schmidt, Kenneth J., to General Trailer Co. Load distributor with articulated ground support. 4,705,288, Cl. 280-405.00R.
Schmiedel, James P.; and Moye, Lawrence D., to Square D Company. Terminal structure for a coil. 4,705,341, Cl. 439-544.000.
Schmitt, Fritz, to General Motors Corporation. Electrical fuse assembly. 4,706,059, Cl. 337-297.000.
Schmoock, Roy F.: *See*—
Mannherz, Elmer D.; Schmoock, Roy F.; and Shauger, Herbert A., 4,704,907, Cl. 73-861.170.
Schneider, Robert H., to Versa Technologies, Inc. Bidirectional fluid flow valve. 4,704,947, Cl. 91-518.000.
Schnepfe, Robert W., Jr.: *See*—
Milstead, Leon R.; Lowe, Laban R.; Schnepfe, Robert W., Jr.; and Erickson, Merlin L., 4,704,967, Cl. 102-334.000.
Schoellhammer, Georges: *See*—
Quinart, Pierre; Schoellhammer, Georges; Tableau, Pierre; and Vivien, Francois, 4,704,773, Cl. 29-27.00C.
Schoenwald, Ronald D.; and Chien, Du-Shieng, to University of Iowa Research Foundation. Phenylephrine prodrug useful as mydriatic agent. 4,705,798, Cl. 514-374.000.
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Reichert, Karl-Heinz; Schoeppel, Wolfgang; Ewangelidis, Stawros; Bednarz, Jurgen; and Leute, Ulrich, 4,705,648, Cl. 252-512.000.
Schonenberger, Rolf, to Veit GmbH & Co. Transport means with a foldable suspension carrier. 4,704,969, Cl. 105-148.000.
Schoolman, Arnold. Stereo laser disc viewing system. 4,706,117, Cl. 358-88.000.
Schriewer, Michael; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. Novel antibacterial 7-amino-1(substituted cyclopropyl)-1,4-dihydro-4-oxo-3-quinolinecarboxylic acids. 4,705,788, Cl. 514-254.000.
Schroeder, Edgar C.: *See*—
Owen, Thomas E.; and Schroeder, Edgar C., 4,706,228, Cl. 367-147.000.
Schroeder, Warren W.; and Turner, Eric B., to Texaco Limited. Offshore hydrocarbon production system. 4,705,114, Cl. 166-357.000.
Schuler, Roland: *See*—
Herzog, Kurt; and Schuler, Roland, 4,704,787, Cl. 29-596.000.
Schundehutte, Karl H.: *See*—
Furstenwerth, Hauke; and Schundehutte, Karl H., 4,705,861, Cl. 548-178.000.
Schuster, Hans-Dieter: *See*—
Abthoff, Joerg; Schuster, Hans-Dieter; Loose, Gunter; and Jokl, Bernhard, 4,704,863, Cl. 60-311.000.

Schutten, Herman P.; Sackett, Robert W.; Sedivy, Jan K.; and Taken, Michael E., to Eaton Corporation. Single phase to multiphase frequency multiplier. 4,706,174, Cl. 363-9.000.

Schutten, Herman P.; Sackett, Robert W.; Sedivy, Jan K.; and Taken, Michael E., to Eaton Corporation. Single phase to polyphase bridge-type frequency multiplier. 4,706,175, Cl. 363-9.000.

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Schutten, Herman P.; Sackett, Robert W.; Sedivy, Jan K.; and Taken, Michael E., to Eaton Corporation. Fractional frequency multiplier. 4,706,184, Cl. 363-157.000.

Schwab, August, to Siemens Aktiengesellschaft. Magnet of a nuclear spin tomograph. 4,706,057, Cl. 335-284.000.

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Schwarz, Gerhard, to Braun Aktiengesellschaft. Electronic switching power supply. 4,706,009, Cl. 320-22.000.

Schweitzer, Edmund O., Jr. Surge detector having distributed line inductance pickup. 4,706,016, Cl. 324-102.000.

Schwender, Charles F.; and Dodd, John H., to Ortho Pharmaceutical Corporation. Substituted thiacycloalkeno (3,2-b) pyridines and pharmaceutical compositions and method of use. 4,705,785, Cl. 514-211.000.

Schwerdt, Friedrich: *See*—
Bahrle, Dieter; Schwerdt, Friedrich; and Stehling, Jurgen H., 4,705,592, Cl. 156-630.000.

Scott, Dale K.: *See*—
Feliks, James J.; Culpepper, Will L.; and Scott, Dale K., 4,705,159, Cl. 198-468.800.

Scott, George M. Cockpit transmission assembly. 4,706,091, Cl. 342-42.000.

Scott, Jane V.; and Waggett, Joseph P., to American Cyanamid. Process for the preparation of acellular *Bordetalla pertussis* vaccine. 4,705,686, Cl. 424-92.000.

Scott, Paul F.: *See*—
Liska, Timothy J.; and Scott, Paul F., 4,705,552, Cl. 65-158.000.

Scripter, Robert D. Waste collection device. 4,705,310, Cl. 294-1.400.

Scriver, Richard M., to Goodyear Tire & Rubber Company, The. Process for preparing rubber compositions. 4,705,819, Cl. 523-351.000.

Seal, Michael: *See*—
van Bennekom, Peter K.; and Seal, Michael, 4,705,933, Cl. 219-121.0LC.

Seats, Inc.: *See*—
Hofrichter, James, 4,705,256, Cl. 248-418.000.

Sedivy, Jan K.: *See*—
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Schutten, Herman P.; Sackett, Robert W.; Sedivy, Jan K.; and Taken, Michael E., 4,706,175, Cl. 363-9.000.
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Sedwall, Yngve G.: *See*—
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Seeger Corporation: *See*—
Clements, George W., 4,705,461, Cl. 417-387.000.

Seeger, Gunter A.; and Reger, Arno, to Hengstler Bauelemente GmbH. Relay for the operation of a belt tightener or tensioner for automobile safety belts. 4,705,922, Cl. 200-61.45M.

Seemann, Norbert: *See*—
Gahlau, Heinemann; Hoffmann, Manfred; and Seemann, Norbert, 4,705,139, Cl. 181-290.000.

Segal, Marcos: *See*—
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Segal, Michael G.: *See*—
Wood, Christopher J.; Bradbury, David; Swan, Timothy; Segal, Michael G.; and Sellers, Robin M., 4,705,573, Cl. 134-3.000.

Segura, Serge: *See*—
Longeray, Remi; Lanteri, Pierre; Mathia, Thomas; Jodelet, Francois; and Segura, Serge, 4,705,815, Cl. 521-160.000.

Seiko Instruments & Electronics Ltd.: *See*—
Yamazaki, Tsuneo; Motte, Shunichi; and Shimbo, Masafumi, 4,705,358, Cl. 350-334.000.

Seikosha Co., Ltd.: *See*—
Kizawa, Hiroyuki, 4,706,238, Cl. 368-296.000.

Seki, Masaki: *See*—
Kish, Hajimu; Seki, Masaki; Takegahara, Takashi; and Onishi, Yasuhi, 4,706,201, Cl. 364-474.000.
Kishi, Hajimu; Seki, Masaki; and Takegahara, Takashi, 4,706,200, Cl. 364-474.000.

Sekiguchi, Katsumi: *See*—
Kawai, Yoichi; Abe, Masaru; Yoshihara, Akio; Hayzshi, Shigeru; and Sekiguchi, Katsumi, 4,705,818, Cl. 523-200.000.

Sekiguchi, Mamoru: *See*—
Shitaokoshi, Sachiro; Sekiguchi, Mamoru; Takagi, Toshiaki; and Mori, Toshimichi, 4,705,497, Cl. 604-4.000.

Sekiya, Shinji, to Disco Abrasive Systems, Ltd. Precision device for reducing errors attributed to temperature change reduced. 4,705,016, Cl. 125-13.00R.

Selcukoglu, Yuksel A., to CBI Industries, Inc. Apparatus and method of freezing a feed liquid. 4,704,877, Cl. 62-532.000.

Self, Freddy. Safety seal for an operating lever. 4,705,064, Cl. 137-384.000.

Sellers, Dick: *See*—
Hartley, David H.; and Sellers, Dick, 4,705,217, Cl. 239-142.000.

Sellers, Robin M.: *See*—
Wood, Christopher J.; Bradbury, David; Swan, Timothy; Segal, Michael G.; and Sellers, Robin M., 4,705,573, Cl. 134-3.000.

Sellman, Leonard R.; Embury, Janon F., Jr.; and Beyth, Werner W., to AAI Corporation. Method of forming IR smoke screen. 4,704,966, Cl. 102-334.000.

Selsted, Michael E.: *See*—
Lehrer, Robert I.; Selsted, Michael E.; and Ganz, Tomas, 4,705,777, Cl. 514-12.000.

Semenov, Vladimir: *See*—
Fleischer, Klaus; Gohler, Peter; Mangler, Rolf; Reuther, Christian; Schingnitz, Manfred; Berger, Friedrich; Gudymov, Ernest; Semenov, Vladimir; Fedotov, Vasilj; and Rodionov, Boris, 4,704,971, Cl. 110-264.000.

Senda, Tetsuji; and Baba, Takashi, to Fujimi Kenmazai Kogyo Kabushiki Kaisha. Polishing composition for memory hard disc. 4,705,566, Cl. 106-3.000.

Senek, Dexter S.: *See*—
Geer, Ralph D.; Morgan, Robert L.; and Senek, Dexter S., 4,705,260, Cl. 266-78.000.

Sensormedics Corporation: *See*—
Beebe, Cedric H.; McDavid, Larry S.; and Pawlowski, Michael, 4,705,617, Cl. 204-402.000.

Seo, Iwao: *See*—
Fujii, Tadashi; Yagami, Hiroyuki; Seo, Iwao; and Sasaki, Masahiro, 4,704,774, Cl. 29-25.350.

Sepragen Corporation: *See*—
Andresen, Brian D.; and Fought, Eric R., 4,705,616, Cl. 204-299.00R.

Serizawa, Kenkichi: *See*—
Komatsu, Isamu; and Serizawa, Kenkichi, 4,706,004, Cl. 318-568.000.

Serizawa, Mitsuya: *See*—
Kawamoto, Yoshimichi; Furukawa, Yoshimi; Hamada, Tetsuro; and Serizawa, Mitsuya, 4,705,135, Cl. 180-236.000.

Sestanj, Kazimir; Abraham, Nedumparambil A.; Bellini, Francesco; and Treasurywala, Adi, to Ayerst, McKenna & Harrison, Inc. N-naphthoylglycine derivatives. 4,705,882, Cl. 560-10.000.

Setliff, Harold: *See*—
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,704,976, Cl. 112-262.200.

Seya, Takeshi: *See*—
Ito, Motoya; Takahashi, Noriyoshi; Watanabe, Masatoshi; Abukawa, Toshimi; Seya, Takeshi; Kainuma, Hiroshi; and Syutoo, Toshiyuki, 4,704,789, Cl. 29-609.000.

Seyferth, Dietmar; Yu, Yuan-Fu; and Targos, Tom S., to Massachusetts Institute of Technology. Method for converting Si-H containing polysiloxanes to new and useful preceramic polymers and ceramic materials. 4,705,837, Cl. 528-31.000.

Sgrignoli, Gary J.: *See*—
Citta, Richard W.; Mutzabaugh, Dennis M.; and Sgrignoli, Gary J., 4,706,283, Cl. 380-12.000.
Citta, Richard W.; Mutzabaugh, Dennis M.; and Sgrignoli, Gary J., 4,706,284, Cl. 380-12.000.

Shah, Ashwin N.; and DeMay, Roland, to Mobil Oil Corporation. Mold for producing a plate. 4,705,471, Cl. 425-195.000.

Shamir, Abraham: *See*—
Gregor, Harry P.; Dalven, Paul I.; Hildebrandt, James R.; Hodgins, Leonard T.; Laccetti, Anthony J.; and Shamir, Abraham, 4,705,753, Cl. 435-180.000.

Shandon Southern Products Limited: *See*—
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Sharp Kabushiki Kaisha: *See*—
Ataka, Yasukazu, 4,704,765, Cl. 15-323.000.
Funada, Fumiaki; Kuwagaki, Hiroshi; Yamamoto, Kunihiko; and Matsuura, Masataka, 4,705,360, Cl. 350-344.000.
Hamada, Hiroshi; Nakazawa, Kiyoshi; Take, Hiroshi; Kimura, Naofumi; and Funada, Fumiaki, 4,706,173, Cl. 362-341.000.
Hashimoto, Shintaro; Morita, Akitaka; and Tsuda, Hiroshi, 4,706,288, Cl. 381-51.000.
Hiraga, Yuji; and Ito, Tatsuya, 4,705,383, Cl. 355-3.0DD.
Honda, Toshio; and Nishimura, Kosuke, 4,705,211, Cl. 235-380.000.
Masaki, Yoshifumi, 4,706,248, Cl. 371-3.000.
Nakanishi, Takao, 4,705,928, Cl. 219-10.55B.
Satoh, Masaharu; and Hashimoto, Sadakatsu, 4,706,221, Cl. 365-222.000.

Shatto, Howard L., Jr.; and Smith, George A., to Shell Offshore Inc. Camera vision axis inclination indication apparatus. 4,706,119, Cl. 358-99.000.

Shauger, Herbert A.: *See*—
Mannherz, Elmer D.; Schmoock, Roy F.; and Shauger, Herbert A., 4,704,907, Cl. 73-861.170.

Shaw, Stephen K.: *See*—
London, J. Reid; Bell, Cecil R., Jr.; Edwards, A. Russell; Lathery, Willie M.; Efird, Lee A.; Porter, Richard M.; Shaw, Stephen K.; Costello, Thomas J.; Pike, August A.; Bell, Donald G.; and Setliff, Harold, 4,704,976, Cl. 112-262.200.

Sheats, James R., to Hewlett-Packard Company. Method for photochemically enhancing resolution in photolithography processes. 4,705,729, Cl. 430-5.000.

Sheldon, Sidney; and Butler, James L., Jr. Disposable diaper with wetness indicator. 4,705,513, Cl. 604-361.000.
Shell Offshore Inc.: *See*—
Shatto, Howard L., Jr.; and Smith, George A., 4,706,119, Cl. 358-99.000.
Shell Oil Company: *See*—
Bakker, Johannes, 4,705,467, Cl. 425-7.000.
Blytas, George C.; and Trogus, Frank J., 4,705,530, Cl. 44-1.00R.
Blytas, George C., 4,705,531, Cl. 44-1.00R.
Fong, Howard L.; Diaz, Zaida; and Blytas, George C., 4,705,676, Cl. 423-567.00A.
Shelton, Henry P.: *See*—
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Shen, Nelson M.; Moisson, Marc F.; Arrington, John P.; and Tayeb, AbdulMohamed, to Raychem Corp. Optical fiber coupler. 4,705,347, Cl. 350-96.150.
Sheng, Shinan-Chur S.; Kaiser, Jeffrey; Jacobs, Ralph R.; and Petersen, Alan B., to Spectra-Physics, Inc. Fritless endbell assembly. 4,706,256, Cl. 372-61.000.
Sheppard, Harry R.: *See*—
Lin, Kou C.; Burkhardt, Charles E.; and Sheppard, Harry R., 4,705,578, Cl. 148-108.000.
Sherwood Medical Company: *See*—
Vailancourt, Vincent L., 4,705,709, Cl. 428-36.000.
Shiba, Tetsuo; Takahashi, Kazuhisa; Ikeda, Kenji; and Higuchi, Hideyo, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor light receiving device. 4,706,106, Cl. 357-78.000.
Shibahata, Yasuji; Fukunaga, Yukio; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, to Nissan Motor Co., Ltd. Four-wheel steering control system for vehicle. 4,705,131, Cl. 180-140.000.
Shibahata, Yasuji: *See*—
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Shibata, Haruo: *See*—
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Shibata, Takashi; Yamada, Nobuo; Mada, Yoshikazu; and Iizima, Masaki, to Mitsuba Electric Manufacturing Co., Ltd. Molded commutator with enlarged diameter riser section. 4,705,977, Cl. 310-235.000.
Shiina, Takanori: *See*—
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Shimada, Masaaki; Saito, Koji; and Midorikawa, Yoshiaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for continuously distributing fibrous material and apparatus therefor. 4,705,702, Cl. 427-180.000.
Shimada, Mitsuhiro: *See*—
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Shimazu, Yukihiko, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor intergrated circuit. 4,706,157, Cl. 361-86.000.
Shimbo, Masafumi: *See*—
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Shimizu, Hiroshi; and Kaizuka, Masao, to Kabushiki Kaisha Toshiba. Sequential logic circuit. 4,706,217, Cl. 365-154.000.
Shimojima, Yoji: *See*—
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Shimomura, Takeshi; and Takahashi, Tohru, to Terumo Kabushiki Kaisha. Method for plasma-initiated polymerization. 4,705,612, Cl. 204-165.000.
Shindou, Yoshio; Oka, Joji; Taira, Taketoshi; Miyauchi, Yujiro; and Yamazaki, Fumio, to Nippon Steel Corporation. Anticorrosive weldable coated steel. 4,705,726, Cl. 428-562.000.
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Sholtis, Albert A.: *See*—
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Shop-Vac Corporation: *See*—
Berfield, Robert C., 4,705,282, Cl. 280-47.37R.
Showa Shell Sekiyu Kabushiki Kaisha: *See*—
Inui, Tomoyuki, 4,705,907, Cl. 585-415.000.
Sicard, Stephen T.; Pedro, Brian A.; and Alden, Wayne S., III, to Pylon Company, Inc. Test probe for leadless devices. 4,705,333, Cl. 439-71.000.
Siemens Aktiengesellschaft: *See*—
Doemens, Gunter, 4,705,329, Cl. 324-73.0PC.
Lange, Gerhard; and Weil, Erich, 4,705,571, Cl. 106-287.100.
Rainer, Alois; Ulbrich, Walter; and Gazsi, Lajos, 4,706,188, Cl. 364-200.000.
Reichert, Karl-Heinz; Schoeppel, Wolfgang; Ewangelidis, Stawros; Bednarz, Jurgen; and Leute, Ulrich, 4,705,648, Cl. 252-512.000.
Rummel, Peter; and Wolfgang, Eckhard, 4,705,954, Cl. 250-491.100.
Schwab, August, 4,706,057, Cl. 335-284.000.
Vermeulen, Ronny, 4,705,925, Cl. 200-340.000.
Wentzel, Peter; Huber, Erich; Weiss, Eckardt; and Achatz, Florian, 4,706,136, Cl. 360-39.000.
Signfix Limited: *See*—
Heard, Robert A. H., 4,705,253, Cl. 248-219.400.
Simmonds Precision Products, Inc.: *See*—
Ramsdale, Kurt A.; and Coffman, Keith E., 4,706,203, Cl. 364-509.000.
Simmons, John J. Utilization of low rank coal and peat. 4,705,533, Cl. 44-51.000.
Simon, Georges H.: *See*—
Marcon, Joel M.; Durant, Jacques A.; and Simon, Georges H., 4,704,945, Cl. 89-185.000.
Simons, David R., to Hughes Aircraft Company. Infrared zoom telescope with decentered dome. 4,705,343, Cl. 350-1.300.
Sincoskie, Walter D., to Bell Communications Research, Inc. Interconnection of broadcast networks. 4,706,080, Cl. 340-825.020.
Singer Company, The: *See*—
Rotola, Louis A., Jr.; and Laing, Gordon E., 4,705,547, Cl. 55-374.000.
Sinha, Bikash K., to Schlumberger Technology Corporation. Stress and temperature compensated surface acoustic wave devices. 4,705,979, Cl. 310-313.00A.
Sircar, Shivaji, to Air Products and Chemicals, Inc. Production of mixed gases of controlled composition by pressure swing adsorption. 4,705,541, Cl. 55-26.000.
Sirvet, Enn, to Sun Chemical Corporation. Cup feed apparatus. 4,705,158, Cl. 198-463.400.
Siskin, Michael; Brons, Glen B.; and Green, Gary S., to Exxon Research and Engineering Company. Process for dedusting shale-oil. 4,705,622, Cl. 208-289.000.
Sitzler, Fred C., to Du Pont de Nemours, E. I., and Company. Zero insertion force connector. 4,705,338, Cl. 439-260.000.
Sitzmann, Michael E.; and Gilligan, William H., to United States of America, Navy. 1:3 "mixed" polynitroethyl orthocarbonates from tris(2-fluoro-2,2-dinitroethoxy)methyl trichloromethyl disulfide. 4,705,899, Cl. 568-590.000.
Sjostrom, Douglas D.; and Zemgals, Edvin, to Dyonics, Inc. Surgical system for powered instruments. 4,705,038, Cl. 128-305.000.
Skis Rossignol SA: *See*—
Longeray, Remi; Lanteri, Pierre; Mathia, Thomas; Jodelet, Francois; and Segura, Serge, 4,705,815, Cl. 521-160.000.
Skover, Nick, Jr.: *See*—
Mondloch, Michael J.; and Skover, Nick, Jr., 4,705,271, Cl. 272-130.000.
SKW Trostberg Aktiengesellschaft: *See*—
von Seyerl, Joachim, 4,705,842, Cl. 528-88.000.
Slater, Andrew J.: *See*—
Johnson, Jeffrey C.; Rothon, Stephen; and Slater, Andrew J., 4,704,952, Cl. 98-115.200.

Slater, Frank W., to Southeastern Research and Development, Inc. Domino carrying case, gameboard and game piece turning and shuffling device. 4,705,275, Cl. 273-309.000.

Slaughter, John E.; and Terrell, Robert B., to Texas Instruments Incorporated. Modular, vision system for automation of inspection and process control. 4,706,120, Cl. 358-103.000.

Slayton, Danny L.: *See—*
Palm, Charles S.; Slayton, Danny L.; Lak, Khosrow; Sampson, Peter F.; Davis, David R.; Wheatley, Maurice S., Jr.; Chatham, Gregory A.; Jones, Wayne C.; Charles, Kirk W.; and Ireland, Anthony J., 4,705,385, Cl. 355-4.000.

Slicer, Allan E.; and Whitney, Robert I., to Square D Company. Electrical distribution system having an improved splice joint between busway sections. 4,705,334, Cl. 439-210.000.

Sloop, Clifford E., Sr. Barrel lock assembly. 4,704,881, Cl. 70-158.000.

Small, Hamish; and Mani, Inder, to Dow Chemical Company, The. Method of making a coating and a permselective membrane, ionic polymer therefor, and products thereof. 4,705,636, Cl. 210-638.000.

Smirnov, Oleg V.: *See—*
Kostylev, Alexandr D.; Danilov, Boris B.; Smolyanitsky, Boris N.; Boginsky, Vladimir P.; Kogan, David I.; Smirnov, Oleg V.; and Saveliev, Vyacheslav N., 4,705,119, Cl. 175-92.000.

Smith, David J. H.: *See—*
Alper, Howard; and Smith, David J. H., 4,705,880, Cl. 558-257.000.

Smith, George A.: *See—*
Shatto, Howard L., Jr.; and Smith, George A., 4,706,119, Cl. 358-99.000.

Smith, Kevin. Integral frame connecting apparatus. 4,705,423, Cl. 403-254.000.

Smith, Laurence S.: *See—*
Burr, Kenneth J.; Smith, Laurence S.; and Hazelden, David, 4,704,899, Cl. 73-61.00R.

Smith, Lawrence J., to Pitney Bowes Inc. Method for curing adhesive in the manufacture of transducers. 4,705,587, Cl. 156-321.000.

Smith, Nathan R., to inTEST Corporation. Electronic test head positioner for test systems. 4,705,447, Cl. 414-590.000.

Smith, Sidney B., to Lucas Industries Plc. Arrangement for switching rectified alternating current. 4,706,179, Cl. 363-126.000.

Smith, Thomas E.: *See—*
Stein, Samuel R.; Lewis, Lindon L.; and Smith, Thomas E., 4,706,043, Cl. 331-94.100.

SmithKline Beckman Corporation: *See—*
Labaw, Clifford S.; and Tremper, Alan W., 4,705,862, Cl. 548-215.000.

Smiths Industries Public Limited Company: *See—*
Andrews, Frank P., 4,706,050, Cl. 333-205.000.
Bax, Anton M., 4,705,963, Cl. 307-257.000.

Smolyanitsky, Boris N.: *See—*
Kostylev, Alexandr D.; Danilov, Boris B.; Smolyanitsky, Boris N.; Boginsky, Vladimir P.; Kogan, David I.; Smirnov, Oleg V.; and Saveliev, Vyacheslav N., 4,705,119, Cl. 175-92.000.

SMS Concast Inc.: *See—*
Grothe, Horst; and Arnolds, Gerhard, 4,705,094, Cl. 164-426.000.

Smulders, Engelbertus J. J. M.: *See—*
Hutting, Gerardus T. M.; and Smulders, Engelbertus J. J. M., 4,704,768, Cl. 17-11.000.

Snelling, William E.; and Penn, John E., to Johns Hopkins University, The. Guild array multiplier for binary numbers in two's complement notation. 4,706,210, Cl. 364-758.000.

Societa' Italiana per l'Esercizio Telefonico p.a.: *See—*
Astegiano, Luciano; Bertoglio, Ottavio; Bosco, Fulvio; de Bosio, Alfredo; Franco, Dario; Lampiano, Piero; Melle, Antonio; and Rosboch, Luciano, 4,706,270, Cl. 379-2.000.

Societe Anonyme D.B.A.: *See—*
Kervagoret, Gilbert, 4,705,324, Cl. 303-119.000.
Pressaco, Pierre; and Sauvee, Jean-Paul, 4,705,147, Cl. 188-196.00D.

Societe dite: SOGEA: *See—*
Marchand, Denis, 4,704,972, Cl. 110-345.000.

Societe Electronique de la Region Pays de Loire: *See—*
Colineau, Joseph; and Ahmari, Hossein, 4,706,115, Cl. 358-60.000.

Societe Europeenne de Propulsion: *See—*
Buttazzoni, Bernard; Leseur, Philippe; Thebault, Jacques; and Constant, Georges, deceased, 4,705,694, Cl. 427-2.000.

Societe Nationale des Poudres et Explosifs: *See—*
Maures, Michel; Pasdeloup, Jacques; and Lespinasse, Patrick, 4,705,655, Cl. 264-3.400.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Bouiller, Jean G.; and Soligny, Marcel R., 4,705,454, Cl. 415-197.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (SNECMA): *See—*
Karadimas, Georges, 4,705,452, Cl. 415-115.000.

Societe Nouvelle Baele Gangloff: *See—*
Braymand, Robert, 4,704,958, Cl. 99-470.000.

Societe pour l'Etude et la Fabrication de Circuit Integres Speciaux-E.F.C.I.S.: *See—*
Picco, Andre , 4,706,209, Cl. 364-745.000.

Sockel, Karl H.: *See—*
Weber, Wilhelm; Sockel, Karl H.; Achtenberg, Theo; and Sattleger, Hans, 4,705,826, Cl. 524-860.000.

Sodd, Lal C., to Motorola, Inc. Memory input buffer with hysteresis. 4,706,218, Cl. 365-189.000.

Soeda, Eiichi: *See—*
Nasu, Hisanori; Suzuki, Satoru; Yoshida, Hiroaki; Fukuda, Tomoichi; and Soeda, Eiichi, 4,706,192, Cl. 364-413.000.

Soeters, Raymond A., Jr., to Eaton Corporation. Guide for roller cam follower. 4,704,995, Cl. 123-90.500.

Soga, George: *See—*
Lipes, Arnold; and Soga, George, 4,706,298, Cl. 383-71.000.

Soji, Kazuo; and Nagano, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Method for controlling an articulated robot. 4,705,999, Cl. 318-568.000.

Solex (UK) Limited: *See—*
Pagdin, Brian C., 4,705,219, Cl. 239-397.500.

Soligny, Marcel R.: *See—*
Bouiller, Jean G.; and Soligny, Marcel R., 4,705,454, Cl. 415-197.000.

Solomon, Dennis, to Altman Stage Lighting Co., Inc. Dual-axis tactile feedback light control device. 4,706,006, Cl. 318-640.000.

Solvay & Cie. (Societe Anonyme): *See—*
Vanlautem, Noel; and Gilain, Jacques, 4,705,604, Cl. 203-67.000.

Somerville Belkin Industries Inc.: *See—*
Atkinson, William G., 4,705,929, Cl. 219-10.55E.

Sonntag, Claus: *See—*
Ledent, Pierre; and Sonntag, Claus, 4,705,109, Cl. 166-251.000.

Sonoda, Shinji: *See—*
Michiguchi, Yoshihiro; Takahashi, Fuminobu; Hiramoto, Kazuo; Nishi, Masatsugu; and Sonoda, Shinji, 4,706,031, Cl. 324-337.000.

Sony Corporation: *See—*
Abe, Takao; and Ogaga, Tetsuo, 4,706,111, Cl. 358-21.00R.
Kumagai, Toru; and Kosugi, Yoshihiro, 4,706,108, Cl. 358-10.000.
Machida, Tetsuo; and Ozawa, Kazuo, 4,706,149, Cl. 360-132.000.
Mogi, Takao; and Morizono, Masahiko, 4,706,186, Cl. 364-136.000.
Oba, Seisuke; Mikami, Tsutomu; Suzuki, Hideyuki; Shimada, Mitsuhiro; and Suzuki, Tadashi, 4,706,141, Cl. 360-96.500.
Yamazaki, Takao; and Iwase, Seiichiro, 4,706,211, Cl. 364-760.000.

Sorell, Louis S.: *See—*
Yaghmaie, Farrokh; Najjar, Mitri S.; and Sorell, Louis S., 4,705,537, Cl. 48-197.00R.

Soriano, David S.: *See—*
Van Der Puy, Michael; Soriano, David S.; and Dimmit, Jeffrey H., 4,705,896, Cl. 564-265.000.

Soth, Henry J., to Universal Instruments Corp. Method and apparatus for attaching components to substrates. 4,704,790, Cl. 29-838.000.

Sotoya, Koshiro; Kubo, Makoto; and Okabe, Kazuhiko, to Kao Corporation. Process for the preparation of amphoteric surfactants. 4,705,893, Cl. 562-564.000.

South, Alan; and Kenney, Alan, to Champion Spark Plug Europe S.A. Wiper arm with sliding cap. 4,704,761, Cl. 15-250.190.

Southco, Inc.: *See—*
Bisbing, Robert H., 4,705,308, Cl. 292-108.000.

Southeastern Research and Development, Inc.: *See—*
Slater, Frank W., 4,705,275, Cl. 273-309.000.

Southern Case, Inc.: *See—*
Ward, William W., 4,705,168, Cl. 206-373.000.

Southwest Research Institute: *See—*
Owen, Thomas E.; and Schroeder, Edgar C., 4,706,228, Cl. 367-147.000.

Southwestern Bell Telecommunications, Inc.: *See—*
Baker, William; Pedigo, Michael K.; Atkinson, Noel; and Shelton, Henry P., 4,706,274, Cl. 379-61.000.

Southwire Company: *See—*
Chia, E. Henry, 4,705,096, Cl. 164-476.000.

Spear, A. Gil; and Palett, Anthony P., to Palett, Anthony P. Cellular telephone. 4,706,273, Cl. 379-58.000.

Spectra-Physics, Inc.: *See—*
Sheng, Shinan-Chur S.; Kaiser, Jeffrey; Jacobs, Ralph R.; and Petersen, Alan B., 4,706,256, Cl. 372-61.000.

Spectrol Reliance Limited: *See—*
Charlton, Trevor G., 4,705,943, Cl. 250-231.0SE.

Spectus Limited: *See—*
Tindall, David, 4,705,330, Cl. 239-125.000.

Spence, John R., to Rockwell International Corporation. Non-volatile RAM cell with dual high voltage precharge. 4,706,220, Cl. 365-203.000.

Spencer, Nicholas D., to W. R. Grace & Co. Process and catalyst for the production of formaldehyde from methane. 4,705,771, Cl. 502-255.000.

Speranza, George P.: *See—*
Grigsby, Robert A., Jr.; Dominguez, Richard J. G.; and Speranza, George P., 4,705,814, Cl. 521-159.000.

Sperry Corporation: *See—*
Hamstra, James R.; Koehler, Howard A.; Rusterholz, John T.; and Tanglin, David J., 4,706,191, Cl. 364-200.000.

Spiess, Karl; Baberowski, Waldemar; and Glatter, Otto, to INA Walzlager Schaeffler KG. Universal joint assembly method and apparatus. 4,704,782, Cl. 29-434.000.

Spietschka, Ernst; and Urban, Manfred, to Hoechst Aktiengesellschaft. Process for the preparation of pigments of the anthanthrone series. 4,705,572, Cl. 106-288.00Q.

Spiewok, Leonhard: *See—*
Christ, Alfred; Lehmann, Helmuth; and Spiewok, Leonhard, 4,704,879, Cl. 68-140.000.

Spillert, Charles R.; Suval, William D.; and Lazaro, Eric J., to University of Medicine and Dentistry of New Jersey. Method of determining the existence and/or the monitoring of a pathological condition in a mammal. 4,705,756, Cl. 436-64.000.

Spinas, Stefi. Carrying aid for skis. 4,705,281, Cl. 280-47.13R.

Spindler, Manfred: *See—*
Tanner, Herbert; Bertram, Heidrun-Leonore; Richter, Reinhard; and Spindler, Manfred, 4,705,689, Cl. 426-2.000.
Splaine, Constance K. Compact fire escape. 4,705,141, Cl. 182-48.000.
Sprague Electric Company: *See—*
Higgs, Jacob K., 4,705,964, Cl. 307-278.000.
Maher, Galeb H., 4,706,163, Cl. 361-321.000.
Pan, David S.; Sarma, Kanak C.; Halfacre, Mark A.; Owens, Alexander H.; and Rosier, Brian K., 4,706,102, Cl. 357-23.500.
Square D Company: *See—*
Durivage, Leon W.; and Farrington, Ronald L., 4,706,155, Cl. 361-64.000.
Harmon, Eldred R., 4,705,918, Cl. 174-73.00R.
Schmiedel, James P.; and Moye, Lawrence D., 4,705,341, Cl. 439-544.000.
Slicer, Allan E.; and Whitney, Robert L, 4,705,334, Cl. 439-210.000.
SRI International: *See—*
Acton, Edward M.; Ryan, Kenneth J.; and Tracy, Michael, 4,705,850, Cl. 536-1.100.
Almquist, Ronald G.; and Olsen, Cris M., 4,705,778, Cl. 514-15.000.
Crowe, David F.; Tanabe, Masato; and Peters, Richard, 4,705,783, Cl. 514-180.000.
Srock, Rainer; and Eger, Georg, to Dr. Ing. hcf Porshe Aktiengesellschaft. Door system for motor vehicles. 4,704,822, Cl. 49-502.000.
Staar S.A.: *See—*
d'Alayer de Costemore d'Arc, Stephane M. A., 4,706,233, Cl. 369-33.000.
Stackhouse, David W.; and Heidl, Stephen C., to Research-Cottrell, Inc. Splash bar for cooling tower fill assembly. 4,705,653, Cl. 261-111.000.
Stade, John H., to Mallinckrodt, Inc. Power syringe with volume reducing adapter. 4,705,509, Cl. 604-154.000.
Stadler, Gerald: *See—*
Gratz, Matthias; Hans-Dieter, Schmalz; Stadler, Gerald; and Hildenbrandt, Lothar, 4,705,290, Cl. 280-604.000.
Staehle, Bruce E.: *See—*
Bricker, Jeffery C.; and Staehle, Bruce E., 4,705,620, Cl. 208-206.000.
Stafford, John P.: *See—*
DuPont, Preston S.; Ritter, Robert E.; and Stafford, John P., 4,705,646, Cl. 252-511.000.
Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Open-end friction spinning machine provided with devices for monitoring friction characteristics and conditioning spinning surfaces. 4,704,857, Cl. 57-264.000.
Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Fiber feed arrangement for open-end friction spinning machines. 4,704,860, Cl. 57-401.000.
Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,704,857, Cl. 57-264.000.
Stahlecker, Fritz, 4,704,860, Cl. 57-401.000.
Staibano, Giorgio, to Istituto Gentili S.p.A. Process for the preparation of diphosphonic acids. 4,705,651, Cl. 260-502.50C.
Stamicarbon B.V.: *See—*
Boesten, Wilhelmus H. J.; and Cals, Maria J. H., 4,705,752, Cl. 435-106.000.
Stammann, Gunter; Grolig, Johann; and Waldmann, Helmut, to Bayer Aktiengesellschaft. Process for the production of substituted polyaryl ethers. 4,705,843, Cl. 528-212.000.
Standard Oil Company, The: *See—*
Cesa, Mark C.; Rinz, James E.; and Kopp, Teodora T., 4,705,864, Cl. 548-309.000.
Desmond, Michael J.; Pepera, Marc A.; and Callahan, James L., 4,705,675, Cl. 423-326.000.
Mazanec, Terry J.; Frye, John G., Jr.; and Hardman, Harley F., 4,705,532, Cl. 44-53.000.
Price, Steven C., 4,705,910, Cl. 800-1.000.
Tenhover, Michael A.; Harris, Jonathan H.; and Grasselli, Robert K., 4,705,610, Cl. 204-95.000.
Standard Oil Company (Indiana): *See—*
Brooks, Gary T., 4,705,832, Cl. 525-436.000.
Nemo, Thomas E., 4,705,643, Cl. 252-51.50A.
State of Israel-Ministry of Agriculture: *See—*
Lev, Monick; and Frankstein, Brois, 4,704,846, Cl. 53-522.000.
State of Israel, Ministry of Defence, Israel Military Industries, The: *See—*
Goldfeld, Emil; Harush, Shlomo; Takserman, Yuri; and Weiler, Shmuel, 4,705,237, Cl. 244-3.120.
State of Israel, Ministry of Defence, Military Industries of Israel, The: *See—*
Bercu, Iancu, 4,704,944, Cl. 89-132.000.
STC PLC: *See—*
Ayliffe, Peter J.; and Davey, Anthony B., 4,705,345, Cl. 350-350.00S.
Harland, Geoffrey, 4,706,242, Cl. 370-60.000.
Stearn, Richard A.: *See—*
Lamer, Gerald P.; Lenius, Norbert W.; and Stearn, Richard A., 4,705,180, Cl. 212-190.000.
Stefanick, Stanley W.: *See—*
Leo, Cosmo L.; and Stefanick, Stanley W., 4,705,257, Cl. 248-611.000.
Stehling, Jurgen H.: *See—*
Bahrle, Dieter; Schwerdt, Friedrich; and Stehling, Jurgen H., 4,705,592, Cl. 156-630.000.
Steigelman, James Q.: *See—*
Kemp, Preston B., Jr.; Johnson, Walter A.; and Steigelman, James Q., 4,705,560, Cl. 75-0.50B.
Stein, Samuel R., to Ball Corporation. Atomic or molecular maser cavity resonator. 4,706,042, Cl. 331-94.100.
Stein, Samuel R.; Lewis, Lindon L.; and Smith, Thomas E., to Ball Corporation. Frequency standard using hydrogen maser. 4,706,043, Cl. 331-94.100.
Steinback, Clarence I., to Acrometal Products, Inc. Abrasive surfacing machine. 4,704,823, Cl. 51-110.000.
Steinberger, Ned, to Steinberger Sound Corporation. Tremolo with lever angle control. 4,704,936, Cl. 84-313.000.
Steinberger Sound Corporation: *See—*
Steinberger, Ned, 4,704,936, Cl. 84-313.000.
Steinmetz, Guy R.; and Rule, Mark, to Eastman Kodak Company. Carbonylation process for the production of aromatic acids. 4,705,890, Cl. 562-406.000.
Stereochemical Genetics, Inc.: *See—*
Hendry, Lawrence B.; Diamond, Ana H.; Diamond, Bruce I.; and Ewing, Douglas E., 4,705,796, Cl. 514-328.000.
Sternson Limited: *See—*
Tosh, Douglas; and Flynn, Michael, 4,705,841, Cl. 528-59.000.
Steven Alpert: *See—*
Millerd, Donald L.; and Bell, Marl J., 4,705,998, Cl. 318-444.000.
Steven, Josef; and Hassfurther, Karl, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor fuel element. 4,705,663, Cl. 376-442.000.
Stevenson, John S.: *See—*
Becker, Michael W.; Stevenson, John S.; and Najjar, Mitri S., 4,705,536, Cl. 48-197.00R.
Stewart, Dennis C.: *See—*
McComas, Charles C.; and Stewart, Dennis C., 4,705,203, Cl. 228-119.000.
Stewart, Walter F.: *See—*
Barclay, John A.; Stewart, Walter F.; Henke, Michael D.; and Kalash, Kenneth E., 4,704,871, Cl. 62-3.000.
Stinedurf, Constance V.: *See—*
Kastle, George E.; Kastle, Jennie R.; Stinedurf, Constance V.; Wilson, James E.; and Wilson, Barbara M., 4,705,276, Cl. 273-309.000.
Stinson, Robert E. Bow sight-mounting and accessory-mounting apparatus. 4,704,800, Cl. 33-265.000.
Stockburger, Hermann; and Winderlich, Hans-Georg. Method of securing data on a data support. 4,705,938, Cl. 235-435.000.
Storage Technology Partners 11: *See—*
Melbye, Hartvig E., 4,706,235, Cl. 369-46.000.
Stork PMT B.V.: *See—*
Hutting, Gerardus T. M.; and Smulders, Engelbertus J. J. M., 4,704,768, Cl. 17-11.000.
Stormberg, Hans P.: *See—*
Ganser, Hans G.; Kersten, Reinhard; Schafer, Rolf; and Stormberg, Hans P., 4,705,991, Cl. 315-209.00R.
Stout, W. Douglas, to Brigham Young University. Human powered land vehicle. 4,705,284, Cl. 280-242.0WC.
Stradi, Riccardo: *See—*
Desideri, Derio; Stradi, Riccardo; and Milanese, Alberto, 4,705,855, Cl. 544-370.000.
Strata Bit Corporation: *See—*
Dennis, Mahlon D., 4,705,123, Cl. 175-410.000.
Straubinger, David. Tone hole pad for wind instruments, particularly flutes. 4,704,939, Cl. 84-385.00P.
Striker, Gyorgy: *See—*
Kaffka, Karoly; Lezak, Tibor; Striker, Gyorgy; and Zeisel, Eva, 4,705,216, Cl. 239-18.000.
Stroll, Zoltan: *See—*
Roberts, Allen M.; Sangster, Andrew; and Stroll, Zoltan, 4,706,077, Cl. 340-728.000.
Struve, Alfred; Upadek, Horst; and Geke, Juergen, to Henkel Kommanditgesellschaft auf Aktien. Alkanolamin salts of alkenyl succinic acid dialkyl semiamide corrosion inhibitors. 4,705,666, Cl. 422-16.000.
Stufflebeam, John H.: *See—*
Eckbreth, Alan C.; and Stufflebeam, John H., 4,705,367, Cl. 350-572.000.
Sturza, Mark A., to Litton Systems, Inc. Method and circuit for extraction of Doppler information from a pseudo-noise modulated carrier. 4,706,286, Cl. 380-34.000.
Stuska, Gotthard: *See—*
Ripberger, Emil; Stuska, Gotthard; and Ulrich, Reiner, 4,704,950, Cl. 92-208.000.
Stuyt, Johannes J., to U.S. Philips Corporation. Interference free D-type flip-flop. 4,705,965, Cl. 307-279.000.
Su, Chin B.; Lanzisera, Vincent A.; and Freeman, Richard I., to GTE Laboratories Incorporated. High speed InGaAsP lasers by gain enhancement doping. 4,706,253, Cl. 372-44.000.
Su, Ming H. Oil-pressure transmission device. 4,705,465, Cl. 418-23.000.
Su, Tien-Kuei: *See—*
Kwack, Tae H.; and Su, Tien-Kuei, 4,705,829, Cl. 525-240.000.
Su, Yuanfu; and Jiang, Yuming. Process for recovery of organic acids from aqueous solutions. 4,705,894, Cl. 562-580.000.
Suda, Kakutaro; and Hirao, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Method for fabricating bipolar transistor in integrated circuit. 4,705,599, Cl. 156-653.000.
Suda, Shigeyuki: *See—*
Baba, Takeshi; and Suda, Shigeyuki, 4,706,124, Cl. 358-227.000.
Sudikoff, David: *See—*
Chase, Lee M.; and Sudikoff, David, 4,706,267, Cl. 378-61.000.

Sueda, Tetsuo: *See—*
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,705,730, Cl. 430-57.000.
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,705,731, Cl. 430-57.000.
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,705,732, Cl. 430-57.000.
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,705,733, Cl. 430-57.000.
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,705,734, Cl. 430-57.000.
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,705,735, Cl. 430-57.000.

Suga, Shigeo: *See—*
Suga, Shigeru; Chaki, Kiyoshi; Natori, Etsuji; Suga, Shigeo; and Mitamura, Katsuaki, 4,704,903, Cl. 73-159.000.

Suga, Shigeru; Chaki, Kiyoshi; Natori, Etsuji; Suga, Shigeo; and Mitamura, Katsuaki, to Suga Test Instruments Co., Ltd. Light fastness/weather resistance accelerated test machine with an air mixing regulator. 4,704,903, Cl. 73-159.000.

Suga Test Instruments Co., Ltd.: *See—*
Suga, Shigeru; Chaki, Kiyoshi; Natori, Etsuji; Suga, Shigeo; and Mitamura, Katsuaki, 4,704,903, Cl. 73-159.000.

Sugawara, Kazutake: *See—*
Funada, Saburo; Yoda, Yoshiro; Yoshikawa, Shoji; Doi, Masanori; and Sugawara, Kazutake, 4,706,232, Cl. 369-13.000.

Sugimoto, Hironobu: *See—*
Ando, Tsuneo; Kasuya, Kazusato; Asada, Yukitoshi; and Sugimoto, Hironobu, 4,705,002, Cl. 123-440.000.

Sugimoto, Naoyuki, to Takigen Seizou Co. Ltd. Double-acting locking device for joint control. 4,704,884, Cl. 70-337.000.

Sugimura, Nobuyuki. Pulsation damping means incorporating therein an inner cylinder having laminated resilient valve shoes. 4,705,077, Cl. 138-30.000.

Sugita, Yasutoshi, to Canon Kabushiki Kaisha. Apparatus for reading an arbitrarily oriented image. 4,705,958, Cl. 250-578.000.

Sugiura, Juro: *See—*
Hirabayashi, Yasuyuki; and Sugiura, Juro, 4,706,145, Cl. 360-118.000.

Sugiura, Saburo; Kanada, Kenji; Demukai, Noboru; and Okamoto, Tetsuo, to Daido Tokushuko Kabushiki Kaisha. Scrap melting method. 4,706,258, Cl. 373-2.000.

Suketomo, Toshitaka; and Nezuka, Kenjiro, to Kabushiki Kaisha Komatsu Seisakusho. Control apparatus for use in a power transmission system of construction vehicles. 4,704,922, Cl. 74-733.000.

Sullivan, Donald F., to Telemark Co., Inc. Circuit wiring disposed on solder mask coating. 4,706,167, Cl. 361-406.000.

Sulzer-Escher Wyss GmbH: *See—*
Dahl, Hans K., 4,705,602, Cl. 162-358.000.

Sulzer-Escher Wyss Ltd: *See—*
Christ, Alfred; Lehmann, Helmuth; and Spiewok, Leonhard, 4,704,879, Cl. 68-140.000.

Sumitani, Shinya: *See—*
Matsumura, Toshimi; Sumitani, Shinya; Hayakawa, Takahiro; Hasegawa, Takashi; and Sakakibara, Shuji, 4,705,000, Cl. 123-357.000.

Sumitomo Chemical Company, Limited: *See—*
Saito, Yasuhisa; Takagishi, Hisao; Watanabe, Katsuya; Okuno, Kohichi; Kenmei, Junichi; and Kamio, Kunimara, 4,705,833, Cl. 525-504.000.

Sumitomo Electric Industries, Ltd.: *See—*
Endo, Seiji; and Kikuchi, Eiji, 4,705,482, Cl. 439-460.000.
Okita, Koichi; Toyooka, Shinichi; Asako, Shigeru; and Yamada, Katsuya, 4,705,544, Cl. 55-158.000.

Sumitomo Naugatuck Co., Ltd.: *See—*
Kodama, Mikio; Ito, Akitoshi; Yano, Motoichi; Fujiwara, Takayoshi; and Umeyama, Satoshi, 4,705,827, Cl. 525-67.000.

Sumitomo Pharmaceuticals Company, Limited: *See—*
Yamada, Hirotada; Masai, Naruhito; Ueda, Sinji; Okuda, Takao; Fukasawa, Masatomo; Kato, Masuhiro; and Fukumura, Masataka, 4,705,784, Cl. 514-202.000.
Yamamoto, Michihiro; Ozato, Yukinori; Tamura, Nobuhiko; Miyagishi, Akira; and Hara, Youichi, 4,705,786, Cl. 514-252.000.

Sumitomo Precision Products Co., Ltd.: *See—*
Kanda, Atsushi; Kitani, Kazuo; and Shirai, Kiichirou, 4,705,102, Cl. 165-104.330.

Sumitomo Rubber Industries, Ltd.: *See—*
Iuchi, Munenori, 4,705,091, Cl. 152-541.000.

Sumitomo Wiring Systems, Ltd.: *See—*
Yoshida, Kinji; and Iura, Kazuo, 4,704,855, Cl. 57-58.540.

Sun Chemical Corporation: *See—*
Sirvet, Enn, 4,705,158, Cl. 198-463.400.

Sundstrand Corporation: *See—*
Myers, H. Allen, 4,704,866, Cl. 60-449.000.

Sundstrand Data Control, Inc.: *See—*
Paros, Jerome M.; Tonn, Jeffrey F.; and Wearn, Richard B., Jr., 4,706,259, Cl. 374-117.000.

Sung, Rodney L.; Zoleski, Benjamin H.; and O'Rourke, Ronald L., to Texaco Inc. Haze, oxidation, and corrosion resistant diesel engine lubricant. 4,705,642, Cl. 252-47.500.

Surgidev Corporation: *See—*
Arimond, Timothy V., 4,705,464, Cl. 417-477.000.

Sutton, Donald C., to United States of America, Navy. Pneumatic cable stripper. 4,704,925, Cl. 81-9.400.

Suval, William D.: *See—*
Spillert, Charles R.; Suval, William D.; and Lazaro, Eric J., 4,705,756, Cl. 436-64.000.

Suzuki, Hideyuki: *See—*
Itabashi, Satoshi; Kawakami, Soichiro; Terada, Katsunori; Suzuki, Hideyuki; Furushima, Teruhiko; and Fukaya, Masaki, 4,705,598, Cl. 156-643.000.
Oba, Seisuke; Mikami, Tsutomu; Suzuki, Hideyuki; Shimada, Mitsuhiro; and Suzuki, Tadashi, 4,706,141, Cl. 360-96.500.

Suzuki, Hisatosi: *See—*
Ito, Keiko; Ito, Michiyasu; Tsuji, Shoichi; and Suzuki, Hisatosi, 4,705,812, Cl. 521-92.000.
Ito, Keiko; Ito, Michiyasu; Tsuji, Shoichi; Suzuki, Hisatosi; and Ito, Shoichi, 4,705,813, Cl. 521-92.000.

Suzuki, Keizo: *See—*
Okudaira, Sadayuki; Nishimatsu, Shigeru; Suzuki, Keizo; Ninomiya, Ken; and Hamazaki, Ryoji, 4,705,595, Cl. 156-643.000.

Suzuki, Satoru: *See—*
Nasu, Hisanori; Suzuki, Satoru; Yoshida, Hiroaki; Fukuda, Tomoichi; and Soeda, Eiichi, 4,706,192, Cl. 364-413.000.

Suzuki, Shigeru, to Ricoh Corporation. Laser beam image printing device with multiple sheet size feeding mechanism. 4,706,099, Cl. 346-160.000.

Suzuki, Shigeru: *See—*
Matsumoto, Susumu; Suzuki, Shigeru; Watanabe, Hisao; and Hanabe, Hiroshi, 4,705,554, Cl. 71-88.000.

Suzuki, Shunichi: *See—*
Terada, Kazuo; Kurosawa, Susumu; and Suzuki, Shunichi, 4,706,107, Cl. 357-23.500.

Suzuki, Tadashi; Tomikashi, Minoru; Futami, Toru; and Sakagami, Atsushi, to Nissan Motor Company, Limited. Network system. 4,706,245, Cl. 370-85.000.

Suzuki, Tadashi: *See—*
Oba, Seisuke; Mikami, Tsutomu; Suzuki, Hideyuki; Shimada, Mitsuhiro; and Suzuki, Tadashi, 4,706,141, Cl. 360-96.500.

Swak, Inc.: *See—*
Kastle, George E.; Kastle, Jennie R.; Stinedurf, Constance V.; Wilson, James E.; and Wilson, Barbara M., 4,705,276, Cl. 273-309.000.

Swan, Timothy: *See—*
Wood, Christopher J.; Bradbury, David; Swan, Timothy; Segal, Michael G.; and Sellers, Robin M., 4,705,573, Cl. 134-3.000.

Swanson, Mark G. Adjustable and removable vice stand assembly for motor vehicle. 4,705,254, Cl. 248-287.000.

Swingline Inc.: *See—*
Olesen, Paul; and Lin, Frank H., 4,705,202, Cl. 227-153.000.

Switzer, Jay A., to Union Oil Company of California. Electrical contacts containing thallium (III) oxide. 4,706,104, Cl. 357-67.000.

Syarto, Louis W.: *See—*
Zimmerman, Sanford S.; and Syarto, Louis W., 4,705,438, Cl. 409-132.000.

Symes, Kenneth C.; Langley, John; and Mistry, Kishor K., to Allied Colloids Limited. Polymeric products and their production. 4,705,825, Cl. 524-732.000.

Synthes Ltd. (U.S.A.): *See—*
Klaue, Kaj, 4,705,027, Cl. 128-92.0YY.

Syutoo, Toshiyuki: *See—*
Ito, Motoya; Takahashi, Noriyoshi; Watanabe, Masatoshi; Abukawa, Toshimi; Seya, Takeshi; Kainuma, Hiroshi; and Syutoo, Toshiyuki, 4,704,789, Cl. 29-609.000.

Szakacs, Gabor L.: *See—*
Kaltenbach, Karl W.; Rettew, Stephen; Rudy, John O.; and Szakacs, Gabor L., 4,705,668, Cl. 422-82.000.

Szydlo, Nicolas; Boulitrop, Francois; and Kasprzak, Rolande, to Thomson-CSF. Method of making thin film field effect transistors for a liquid crystal display device. 4,704,784, Cl. 437-41.000.

Taber, Larry D.: *See—*
Yang, Ren-Der; Hamilton, Edwin J., Jr.; and Taber, Larry D., 4,705,848, Cl. 530-399.000.

Tableau, Pierre: *See—*
Quinart, Pierre; Schoellhammer, Georges; Tableau, Pierre; and Vivien, Francois, 4,704,773, Cl. 29-27.00C.

Tabuchi, Jyoichi: *See—*
Itaba, Yasushi; Saito, Keichiro; Tabuchi, Jyoichi; and Yoshizawa, Masao, 4,705,714, Cl. 428-215.000.

Taga Electric Co., Ltd.: *See—*
Mishiro, Shoji, 4,705,980, Cl. 310-323.000.

Taguchi, Ichiro: *See—*
Kirigaya, Tadayuki; and Taguchi, Ichiro, 4,705,375, Cl. 354-275.000.

Taira, Taketoshi: *See—*
Shindou, Yoshio; Oka, Joji; Taira, Taketoshi; Miyauchi, Yujiro; and Yamazaki, Fumio, 4,705,726, Cl. 428-562.000.

Taiyo Sanso Co., Ltd.: *See—*
Imaike, Sekiji; Hata, Takeki; and Yamazaki, Norio, 4,704,873, Cl. 62-64.000.

Tajima, Shinobu: *See—*
Mori, Shunji; Tajima, Shinobu; and Itoh, Atsushi, 4,705,451, Cl. 414-70.000.

Takada, Kousuke; and Kousaka, Akira, to Kabushiki Kaisha Toshiba. Magnetron with a ceramic stem having a cathode support structure. 4,705,989, Cl. 315-39.510.

Takada, Shunji: *See*—
Mihayashi, Keiji; and Takada, Shunji, 4,705,743, Cl. 430-385.000.

Takagi, Kazuhiko, to Brother Kogyo Kabushiki Kaisha. Image reading device. 4,706,125, Cl. 358-256.000.

Takagi, Toshiaki: *See*—
Shitaokoshi, Sachiro; Sekiguchi, Mamoru; Takagi, Toshiaki; and Mori, Toshimichi, 4,705,497, Cl. 604-4.000.

Takagishi, Hisao: *See*—
Saito, Yasuhisa; Takagishi, Hisao; Watanabe, Katsuya; Okuno, Kohichi; Kenmei, Junichi; and Kamio, Kunimara, 4,705,833, Cl. 525-504.000.

Takahashi, Akira: *See*—
Danno, Yoshiaki; Takahashi, Akira; and Iida, Kazumasa, 4,705,001, Cl. 123-417.000.

Takahashi, Fuminobu: *See*—
Michiguchi, Yoshihiro; Takahashi, Fuminobu; Hiramoto, Kazuo; Nishi, Masatsugu; and Sonoda, Shinji, 4,706,031, Cl. 324-337.000.

Takahashi, Hiroshi; Tamura, Masanobu; and Sato, Kunihiko, to Toyota Jidosha Kabushiki Kaisha. Fuel injection control system for internal combustion engine. 4,705,004, Cl. 123-491.000.

Takahashi, Kazuhisa: *See*—
Shiba, Tetsuo; Takahashi, Kazuhisa; Ikeda, Kenji; and Higuchi, Hideyo, 4,706,106, Cl. 357-78.000.

Takahashi, Koji: *See*—
Sasaki, Noboru; and Takahashi, Koji, 4,705,744, Cl. 430-505.000.

Takahashi, Mutsuo: *See*—
Iwama, Katsuaki; Takahashi, Mutsuo; and Shibata, Haruo, 4,705,986, Cl. 313-487.000.

Takahashi, Noriyoshi: *See*—
Ito, Motoya; Takahashi, Noriyoshi; Watanabe, Masatoshi; Abukawa, Toshimi; Seya, Takeshi; Kainuma, Hiroshi; and Syutoo, Toshiyuki, 4,704,789, Cl. 29-609.000.

Takahashi, Shino: *See*—
Arai, Yoshinao; Takahashi, Shino; Oikawa, Eigo; Sato, Shigeru; and Kobayashi, Hideaki, 4,706,187, Cl. 364-191.000.

Takahashi, Tohru: *See*—
Shimomura, Takeshi; and Takahashi, Tohru, 4,705,612, Cl. 204-165.000.

Takahashi, Yutaka: *See*—
Kato, Shinichi; Sasaki, Masahiko; Kato, Tadashi; Kanno, Masahide; Takahashi, Yutaka; and Saito, Katsuyuki, 4,706,118, Cl. 358-98.000.

Takasago Medical Industry, Co., Ltd.: *See*—
Sakaguchi, Ushio; Nakano, Masahiro; and Uchida, Mitsukuni, 4,705,039, Cl. 128-334.00C.

Takasago Perfumery Co., Ltd.: *See*—
Okano, Tamon; Kumobayashi, Hidenori; Akutagawa, Susumu; Kiji, Jitsuo; Konishi, Hisatoshi; Fukuyama, Keiichi; and Shimano, Yasunobu, 4,705,895, Cl. 564-15.000.

Takasaki, Kunihiko, to Takigen Seizou Co. Ltd. Door handle latch and lock mechanism. 4,704,882, Cl. 70-215.000.

Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanada, Hideaki; and Kawabata, Kohji, 4,705,851, Cl. 540-215.000.

Takata, Hajime: *See*—
Nakano, Akihiko; Hibino, Takeshi; Takata, Hajime; and Yoshida, Manabu, 4,705,911, Cl. 136-251.000.

Takatsu, Haruyoshi; Sasaki, Makoto; Tanaka, Yasuyuki; and Sato, Hisato, to Dainippon Ink and Chemicals, Inc. Tolan-type nematic liquid crystalline compounds. 4,705,870, Cl. 549-369.000.

Takatsu, Haruyoshi; Sasaki, Makoto; Tanaka, Yasuyuki; and Sato, Hisato, to Dainippon Ink and Chemicals, Inc. Tolan-type nematic liquid crystalline compounds. 4,705,905, Cl. 585-25.000.

Takaya, Takao; Takasugi, Hisashi; Masugi, Takashi; Yamanada, Hideaki; and Kawabata, Kohji, to Fujisawa Pharmaceutical Co., Ltd. Process for the preparation of 3-phosphoniummethyl-3-cephem compounds. 4,705,851, Cl. 540-215.000.

Takayama, Makoto; and Sakurada, Nobuaki, to Canon Kabushiki Kaisha. Video signal processing system. 4,706,132, Cl. 358-336.000.

Take, Hiroshi: *See*—
Hamada, Hiroshi; Nakazawa, Kiyoshi; Take, Hiroshi; Kimura, Naofumi; and Funada, Fumiaki, 4,706,173, Cl. 362-341.000.

Takeda Chemical Industries, Ltd.: *See*—
Masakazu, Kikuchi; and Kazuo, Nakahama, 4,705,750, Cl. 435-68.000.

Takeda, Hisanobu; and Aso, Yasuhiro, to Aisin Seiki Kabushiki Kaisha. Washing device for parts of human body. 4,704,748, Cl. 4-420.400.

Takeda, Kenji: *See*—
Imoto, Yuzo; Takei, Toshihiro; Hattori, Yoshiyuki; Uno, Haruhiko; Inagaki, Mitsuo; and Takeda, Kenji, 4,705,323, Cl. 303-116.000.

Takegahara, Takashi: *See*—
Kish, Hajimu; Seki, Masaki; Takegahara, Takashi; and Onishi, Yasushi, 4,706,201, Cl. 364-474.000.
Kishi, Hajimu; Seki, Masaki; and Takegahara, Takashi, 4,706,200, Cl. 364-474.000.

Takei, Toshihiro: *See*—
Imoto, Yuzo; Takei, Toshihiro; Hattori, Yoshiyuki; Uno, Haruhiko; Inagaki, Mitsuo; and Takeda, Kenji, 4,705,323, Cl. 303-116.000.

Taken, Michael E.: *See*—
Schutten, Herman P.; Sackett, Robert W.; Sedivy, Jan K.; and Taken, Michael E., 4,706,174, Cl. 363-9.000.
Schutten, Herman P.; Sackett, Robert W.; Sedivy, Jan K.; and Taken, Michael E., 4,706,175, Cl. 363-9.000.
Schutten, Herman P.; Sackett, Robert W.; Sedivy, Jan K.; and Taken, Michael E., 4,706,183, Cl. 363-157.000.
Schutten, Herman P.; Sackett, Robert W.; Sedivy, Jan K.; and Taken, Michael E., 4,706,184, Cl. 363-157.000.

Takenaka, Takaji; Watanabe, Hideki; and Imada, Haruhiko, to Hitachi Microcomputer Engineering Co., Ltd.; and Hitachi, Ltd. Multilayer circuit board. 4,706,165, Cl. 361-403.000.

Takeshima, Akira: *See*—
Tsuchiya, Yutaka; Aoshima, Shinichirou; and Takeshima, Akira, 4,705,397, Cl. 356-345.000.

Takeyama, Yutaka: *See*—
Kiyono, Yasuhiro; and Takeyama, Yutaka, 4,705,959, Cl. 307-9.000.

Taki, Youichirou, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit device with high breakdown voltage level. 4,705,968, Cl. 307-456.000.

Takigen Seizou Co. Ltd.: *See*—
Sugimoto, Naoyuki, 4,704,884, Cl. 70-337.000.
Takasaki, Kunihiko, 4,704,882, Cl. 70-215.000.

Takserman, Yuri: *See*—
Goldfeld, Emil; Harush, Shlomo; Takserman, Yuri; and Weiler, Shmuel, 4,705,237, Cl. 244-3.120.

Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, to Fuji Photo Film Co., Ltd. Photographic polyolefin coated paper. 4,705,746, Cl. 430-538.000.

Tamasi, Piroska: *See*—
Madi-Szabo, Laszlo ; Morvai, Margit; Horvath nee Feher, Eva; Jansco, Sandor; Tamasi, Piroska; Kovacs, Istvan; Kiss nee Loss, Ilona Maria; Bacsa, Gyorgy; Kubala nee Papp, Maria; and Bene nee Horvath, Magdolna, 4,705,779, Cl. 514-27.000.

Tamura, Masanobu: *See*—
Takahashi, Hiroshi; Tamura, Masanobu; and Sato, Kunihiko, 4,705,004, Cl. 123-491.000.

Tamura, Nobuhiko: *See*—
Yamamoto, Michihiro; Ozato, Yukinori; Tamura, Nobuhiko; Miyagishi, Akira; and Hara, Youichi, 4,705,786, Cl. 514-252.000.

Tanabe, Masato: *See*—
Crowe, David F.; Tanabe, Masato; and Peters, Richard, 4,705,783, Cl. 514-180.000.

Tanaka, Hidenori, to Victor Company of Japan, Ltd. Head switching signal producing circuit with compensation of a phase error due to the positioning of a rotary drum head and a rotational phase detector. 4,706,137, Cl. 360-64.000.

Tanaka, Hitoshi: *See*—
Hattori, Yoshiyuki; Nomura, Ken; Goshima, Takahiro; and Tanaka, Hitoshi, 4,705,492, Cl. 474-49.000.

Tanaka, Masaaki: *See*—
Ogita, Akira; and Tanaka, Masaaki, 4,705,386, Cl. 355-4.000.

Tanaka, Masanori: *See*—
Kobayashi, Osamu; Akagawa, Masaki; Tanaka, Masanori; Ishii, Jun; and Yamagishi, Ryoji, 4,706,202, Cl. 364-479.000.

Tanaka, Takeshi: *See*—
Sakakibara, Yasuyuki; Abe, Seiko; Tomita, Masahiro; Yorita, Hiroshi; Tanaka, Takeshi; and Igashira, Toshihiko, 4,705,003, Cl. 123-449.000.

Tanaka, Yasuyuki: *See*—
Takatsu, Haruyoshi; Sasaki, Makoto; Tanaka, Yasuyuki; and Sato, Hisato, 4,705,870, Cl. 549-369.000.
Takatsu, Haruyoshi; Sasaki, Makoto; Tanaka, Yasuyuki; and Sato, Hisato, 4,705,905, Cl. 585-25.000.

Tanaka, Yukitaka; Irinatsu, Yuichi; Noguchi, Aiko; and Kobayashi, Takashi, to Kao Corporation. Substitute composition for cocoa butter. 4,705,692, Cl. 426-607.000.

Tang, Alex K.: *See*—
Wadhera, Anil K.; Tang, Alex K.; and Basser, Theodore E., 4,705,916, Cl. 174-35.0GC.

Tanglin, David J.: *See*—
Hamstra, James R.; Koehler, Howard A.; Rusterholz, John T.; and Tanglin, David J., 4,706,191, Cl. 364-200.000.

Taniguchi, Fumio; and Matsuno, Tomio, to Nissan Motor Co., Ltd. Quick freeze cooling/heating unit powered by automotive air conditioner. 4,705,099, Cl. 165-12.000.

Taniguchi, Masato: *See*—
Kojima, Takio; and Taniguchi, Masato, 4,704,998, Cl. 123-271.000.

Taniguchi, Nobuyuki: *See*—
Mukai, Hiromu; Yamaki, Toshio; Fujino, Akihiko; Izumi, Shuji; Nakai, Masaaki; and Taniguchi, Nobuyuki, 4,705,382, Cl. 354-412.000.

Tanimoto, Masahiro: *See*—
Tsuji, Katsuya; Tanimoto, Masahiro; Hirano, Akihiro; and Yamada, Takeshi, 4,705,669, Cl. 422-93.000.

Tanioka, Hiroshi; Ogino, Yoshitaka; Inoue, Yutaka; Naito, Masataka; and Hayakawa, Kimiaki, to Canon Kabushiki Kaisha. Image reading and converting apparatus. 4,706,128, Cl. 358-286.000.

Tanner, Herbert; Bertram, Heidrun-Leonore; Richter, Reinhard; and Spindler, Manfred, to Degussa Aktiengesellschaft. Use of aqueous sodium or potassium methioninate solution for supplemental mixed fodders with methionine. 4,705,689, Cl. 426-2.000.

Tapmatic Corporation: *See*—
Johnson, Allan S., 4,705,437, Cl. 408-139.000.

Targos, Tom S.: *See*—
Seyferth, Dietmar; Yu, Yuan-Fu; and Targos, Tom S., 4,705,837, Cl. 528-31.000.

Tarnai, Gyorgy, to Vasipari Kutato es Fejleszto Vallalat. Control specimen for evaluation of non-destructive test results, artificial inclusions and process for producing control specimens. 4,704,892, Cl. 73-1.0DV.

Tarter, James H., to Allied Corporation. Disc brake. 4,705,146, Cl. 188-73.100.

Taya, Takeyoshi: *See*—
Ito, Toshio; Fujio, Shunichi; and Taya, Takeyoshi, 4,705,092, Cl. 164-34.000.

Tayeb, AbdulMohamed: *See*—
Shen, Nelson M.; Moisson, Marc F.; Arrington, John P.; and Tayeb, AbdulMohamed, 4,705,347, Cl. 350-96.150.

Taylor, Paul R. Power train having an infinitely variable transmission. 4,704,923, Cl. 74-785.000.

TDK Corporation: *See*—
Hirabayashi, Yasuyuki; and Sugiura, Juro, 4,706,145, Cl. 360-118.000.

Technion Research & Development Foundation: *See*—
Manor, Gedalyahu, 4,704,851, Cl. 56-328.0TS.

Technology Unlimited, Inc.: *See*—
Gebo, W. Blair; Lau, John R.; and Jacob, Joseph, 4,705,804, Cl. 514-474.000.

Tektronix, Inc.: *See*—
Ainsworth, Walter W.; and Metz, Arthur J., 4,705,961, Cl. 307-228.000.
Baur, Bruce K., 4,706,154, Cl. 361-56.000.

Teledyne Linair Engineering: *See*—
Beiley, Mark J., 4,705,302, Cl. 285-47.000.

Telemark Co., Inc.: *See*—
Sullivan, Donald F., 4,706,167, Cl. 361-406.000.

Temple University-of the Commonwealth System of Higher Education: *See*—
Eldridge, Charles J., 4,705,171, Cl. 206-438.000.

Tenhover, Michael A.; Harris, Jonathan H.; and Grasselli, Robert K., to Standard Oil Company, The. Anodes containing iridium based amorphous metal alloys and use thereof as halogen electrodes. 4,705,610, Cl. 204-95.000.

Tepperberg, Phillip S. Hand augmenting spinal manipulator encircling the hand. 4,705,030, Cl. 128-69.000.

Terada, Katsunori: *See*—
Itabashi, Satoshi; Kawakami, Soichiro; Terada, Katsunori; Suzuki, Hideyuki; Furushima, Teruhiko; and Fukaya, Masaki, 4,705,598, Cl. 156-643.000.

Terada, Kazuo; Kurosawa, Susumu; and Suzuki, Shunichi, to Nippon Electric Co., Ltd. IC memory cells with reduced alpha particle influence. 4,706,107, Cl. 357-23.500.

Terada, Takami: *See*—
Yamada, Yukifumi; Terada, Takami; and Miyagawa, Toshihito, 4,705,318, Cl. 297-362.000.

Terrell, Robert B.: *See*—
Slaughter, John E.; and Terrell, Robert B., 4,706,120, Cl. 358-103.000.

Terumo Kabushiki Kaisha: *See*—
Fujii, Tadashi; Yagami, Hiroyuki; Seo, Iwao; and Sasaki, Masahiro, 4,704,774, Cl. 29-25.350.
Shimomura, Takeshi; and Takahashi, Tohru, 4,705,612, Cl. 204-165.000.
Shitaokoshi, Sachiro; Sekiguchi, Mamoru; Takagi, Toshiaki; and Mori, Toshimichi, 4,705,497, Cl. 604-4.000.
Yamamoto, Yuichi; and Sameshima, Tadashi, 4,705,628, Cl. 210-289.000.

Teske, Lothar. Apparatus for stoking a combustor. 4,705,443, Cl. 414-173.000.

Testa, Raymond T.: *See*—
Carter, Guy T.; Greenstein, Michael; Goodman, Joseph J.; Borders, Donald B.; Maiese, William M.; and Testa, Raymond T., 4,705,688, Cl. 424-122.000.

Texaco Inc.: *See*—
Alexander, David C., 4,705,897, Cl. 564-445.000.
Becker, Michael W.; Stevenson, John S.; and Najjar, Mitri S., 4,705,536, Cl. 48-197.00R.
Gilmer, William N., 4,705,542, Cl. 55-93.000.
Grigsby, Robert A., Jr.; Dominguez, Richard J. G.; and Speranza, George P., 4,705,814, Cl. 521-159.000.
McEntire, Edward E.; and Knifton, John F., 4,705,898, Cl. 564-467.000.
Najjar, Mitri S.; and Kessler, Richard V., 4,705,538, Cl. 48-197.00R.
Najjar, Mitri S.; Becker, Michael W.; and Muan, Arnulf, 4,705,539, Cl. 48-197.00R.
Sanderson, John R.; and Larkin, John M., 4,705,903, Cl. 568-922.000.
Sung, Rodney L.; Zoleski, Benjamin H.; and O'Rourke, Ronald L., 4,705,642, Cl. 252-47.500.
Yaghmaie, Farrokh; Najjar, Mitri S.; and Sorell, Louis S., 4,705,537, Cl. 48-197.00R.

Texaco Limited: *See*—
Schroeder, Warren W.; and Turner, Eric B., 4,705,114, Cl. 166-357.000.

Texas Instruments Incorporated: *See*—
Bayraktaroglu, Burhan, 4,706,041, Cl. 331-52.000.
Curran, Patrick A., 4,704,785, Cl. 437-110.000.
DeFilippis, Pietro; Calenda, Ciro; and Notaro, Giuseppe, 4,706,152, Cl. 361-32.000.
Frazier, Gary A.; Frensley, William R.; and Reed, Mark A., 4,705,361, Cl. 350-355.000.
Slaughter, John E.; and Terrell, Robert B., 4,706,120, Cl. 358-103.000.
Vergara, Sossio; D'Arrigo, Sebastiano; and Imondi, Giuliano, 4,706,011, Cl. 323-274.000.

Thaisrivongs, Suvit, to Upjohn Company, The. Novel renin inhibiting peptides having a gamma lactam pseudo dipeptide insert. 4,705,846, Cl. 530-332.000.

Thebault, Jacques: *See*—
Buttazzoni, Bernard; Leseur, Philippe; Thebault, Jacques; and Constant, Georges, deceased, 4,705,694, Cl. 427-2.000.

Theeuwes, Felix: *See*—
Wong, Patrick S. L.; and Theeuwes, Felix, 4,705,515, Cl. 604-892.000.

Theissen, Friedel; and Fieseler, Heinrich, to Messer Griesheim GmbH. Double walled insulated container for storing low boiling liquified gases. 4,705,189, Cl. 220-465.000.

Thiebaud, Daniel: *See*—
Besson, Raymond; Delaite, Richard; Genestier, Gerard; Maitre, Pierre; Renard, Georges; Thiebaud, Daniel; and Valentin, Jean-Pascal, 4,705,982, Cl. 310-356.000.

Thieke, Michael D. Snuff holder and dispenser. 4,705,165, Cl. 206-253.000.

Thijssen, Henricus A. C., to Grasso's Koninklijke Machinefabrieken N.V. Apparatus and process for separating solid particles from a liquid suspension and/or for the purification or leaching of solid particles. 4,705,624, Cl. 210-96.100.

Thompson, James B.; and Junge, Brent A., to General Electric Company. Household refrigerator air flow system. 4,704,874, Cl. 62-187.000.

Thomson CSF: *See*—
Chautemps, Jacques, 4,706,123, Cl. 358-213.190.
Graindorge, Philippe; Arditty, Herve ; and Lefevre, Herve , 4,705,399, Cl. 356-350.000.
Guerin, Stanislas P., 4,706,199, Cl. 364-460.000.
Szydlo, Nicolas; Boulitrop, Francois; and Kasprzak, Rolande, 4,704,784, Cl. 437-41.000.

Thone, Ernst. Method and apparatus for measuring the viscosity of a liquid. 4,704,898, Cl. 73-54.000.

Thornell, John S.; and Kleinman, Dennis P. Glove with removable digits. 4,704,743, Cl. 2-159.000.

Thornley, Joseph S.: *See*—
Muhich, John S.; and Thornley, Joseph S., 4,706,074, Cl. 340-709.000.

Thornton, Mark R.: *See*—
Sathre, Curtis J., Jr.; and Thornton, Mark R., 4,705,930, Cl. 219-492.000.

Thornton, Robert L.; and Burnham, Robert D., to Xerox Corporation. Phased array semiconductor laser with preferred emission in the fundamental supermode. 4,706,255, Cl. 372-50.000.

Thurman, Daniel M. Computerized airspace control system. 4,706,198, Cl. 364-439.000.

Tilliette, Zephyr, to Commissariat a l'Energie Atomique. Fast neutron nuclear reactor with a steam generator integrated into the vessel. 4,705,662, Cl. 376-405.000.

Timms, Graham H.: *See*—
Horwell, David C.; and Timms, Graham H., 4,705,807, Cl. 514-650.000.

Tindall, David, to Spectus Limited. Fluid injectors. 4,705,330, Cl. 239-125.000.

Tioxide Group PLC: *See*—
Kay, Peter D.; and Girot, Michael C., 4,705,568, Cl. 106-26.000.

Tire Inflation Systems Corp.: *See*—
Bartos, Josef A., 4,705,090, Cl. 152-417.000.

Toa Nenryo Kogyo K.K.: *See*—
Itaba, Yasushi; Saito, Keichiro; Tabuchi, Jyoichi; and Yoshizawa, Masao, 4,705,714, Cl. 428-215.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Makishima, Tokuo, 4,705,830, Cl. 525-333.400.

Toda, Minoru, to RCA Corporation. Two lens optical package and method of making same. 4,705,351, Cl. 350-96.180.

Todaro, Frank A.; and Dougherty, John J., to General Electric Company. Circuit breaker with self-contained electronic trip actuator and undervoltage release control circuit. 4,706,158, Cl. 361-92.000.

Todd, Richard A.: *See*—
Ramsey, Roswitha S.; and Todd, Richard A., 4,705,947, Cl. 250-386.000.
Ramsey, Roswitha S.; and Todd, Richard A., 4,705,948, Cl. 250-386.000.

Tokai Television Broadcasting Company Limited: *See*—
Kojima, Nobutoshi, 4,706,135, Cl. 360-14.100.

Tokita, Shigeo: *See*—
Ohtsuka, Masasuke; Harada, Yoshinori; Tokita, Shigeo; and Maniwa, Hideyo, 4,705,836, Cl. 526-318.100.

Tokunaga, Ichiro: *See*—
Matsunaga, Hiroshi; Tokunaga, Ichiro; Shimojima, Yoji; and Obata, Kosei, 4,705,348, Cl. 350-96.150.

Tokyo Electric Co., Ltd.: *See*—
Nakayama, Tetsuro, 4,706,098, Cl. 346-140.00R.

Tokyo Gas Co. Limited: *See*—
Kawase, Akira; and Imamura, Minoru, 4,704,897, Cl. 73-40.50R.

Tokyo Juki Industrial Co., Ltd.: *See*—
Nakamura, Masaya, 4,705,167, Cl. 206-348.000.
Nukushina, Masanori, 4,704,977, Cl. 112-266.100.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Nishimura, Shinichi, 4,705,045, Cl. 128-648.000.

Tolkoff, Marc J.: *See*—
Mueller, Peter R.; Brown, Alan S.; Tolkoff, Marc J.; and Crawford, Frank B., 4,705,040, Cl. 128-334.00R.

Tom, Edward; and McGovern, Douglas E., to RCA Corporation. Security system. 4,706,069, Cl. 340-541.000.

Toma, Peter P. Method using a programmed digital computer system for translation between natural languages. 4,706,212, Cl. 364-900.000.

Tomikashi, Minoru: *See*—
Suzuki, Tadashi; Tomikashi, Minoru; Futami, Toru; and Sakagami, Atsushi, 4,706,245, Cl. 370-85.000.
Tomita, Masahiro: *See*—
Sakakibara, Yasuyuki; Abe, Seiko; Tomita, Masahiro; Yorita, Hiroshi; Tanaka, Takeshi; and Igashira, Toshihiko, 4,705,003, Cl. 123-449.000.
Tonn, Jeffrey F.: *See*—
Paros, Jerome M.; Tonn, Jeffrey F.; and Wearn, Richard B., Jr., 4,706,259, Cl. 374-117.000.
Topfl, Rosemarie, to Ciba-Geigy Corporation. Cationic reaction products formed from 1-aminoalkyl-imidazole compounds and epihalohydrins. 4,705,865, Cl. 548-341.000.
Toray Industries, Inc.: *See*—
Miwa, Kishio; Kihara, Makoto; Sakaya, Kazuyuki; and Inoue, Takehisa, 4,705,627, Cl. 210-264.000.
Torgeson, W. Lee, to Resnick, Joseph A. Speech prosthesis. 4,706,292, Cl. 381-70.000.
Torii, Nobutoshi: *See*—
Nakashima, Seiichiro; Toyoda, Kenichi; and Torii, Nobutoshi, 4,706,001, Cl. 318-568.000.
Torre, Frank M.; Crush, John F.; and Masak, Raymond J., to Hazeltine Corporation. Differential phase modulation. 4,706,261, Cl. 375-27.000.
Tosh, Douglas; and Flynn, Michael, to Sternson Limited. TBEA linked epoxy-urethanes. 4,705,841, Cl. 528-59.000.
Toshioka, Saiji: *See*—
Endo, Yasuhisa; Mizuhara, Shuhei; Murakami, Satoshi; Beppu, Osamu; and Toshioka, Saiji, 4,704,997, Cl. 123-198.0DB.
Townsend, James H., Jr.: *See*—
Blackmer, David E.; and Townsend, James H., Jr., 4,706,287, Cl. 351-17.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Ohkura, Yosuke, 4,705,757, Cl. 436-172.000.
Toyoda Gosei Co., Ltd.: *See*—
Kisanuki, Hisayuki, 4,704,820, Cl. 49-441.000.
Toyoda, Kenichi: *See*—
Nakashima, Seiichiro; Toyoda, Kenichi; and Torii, Nobutoshi, 4,706,001, Cl. 318-568.000.
Nakashima, Seiichiro; Toyoda, Kenichi; and Sakakibara, Shinsuke, 4,706,003, Cl. 318-568.000.
Toyooka, Shinichi: *See*—
Okita, Koichi; Toyooka, Shinichi; Asako, Shigeru; and Yamada, Katsuya, 4,705,544, Cl. 55-158.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Ito, Toshio; Fujio, Shunichi; and Taya, Takeyoshi, 4,705,092, Cl. 164-34.000.
Ota, Kazuhide; and Abe, Susumu, 4,705,762, Cl. 501-87.000.
Saotome, Kaoru; Sasaki, Hiroyuki; and Kanbara, Katsuhiro, 4,705,244, Cl. 248-68.100.
Takahashi, Hiroshi; Tamura, Masanobu; and Sato, Kunihiko, 4,705,004, Cl. 123-491.000.
Yamada, Yukifumi; Terada, Takami; and Miyagawa, Toshihito, 4,705,318, Cl. 297-362.000.
Tracy, Michael: *See*—
Acton, Edward M.; Ryan, Kenneth J.; and Tracy, Michael, 4,705,850, Cl. 536-1.100.
Traffanstedt, Albert J.; and Traffanstedt, Roy. Heated socks. 4,705,935, Cl. 219-211.000.
Traffanstedt, Roy: *See*—
Traffanstedt, Albert J.; and Traffanstedt, Roy, 4,705,935, Cl. 219-211.000.
Tran, Minh Q.; and Bondeson, Anders, to Centre de Recherches en Physique des Plasma (CRPP). Device for guiding an electron beam. 4,705,988, Cl. 315-4.000.
Tratz, Manfred: *See*—
Mohr, Karl-Heinz; and Tratz, Manfred, 4,705,057, Cl. 134-180.000.
Traver, Frank J.: *See*—
Lane, Kimberley J.; and Traver, Frank J., 4,705,704, Cl. 427-389.900.
Treasurywala, Adi: *See*—
Sestanj, Kazimir; Abraham, Nedumparambil A.; Bellini, Francesco; and Treasurywala, Adi, 4,705,882, Cl. 560-10.000.
Treher, Elizabeth N.: *See*—
Nunn, Adrian D.; Feld, Thomas A.; and Treher, Elizabeth N., 4,705,849, Cl. 534-14.000.
Treiber, Fritz F., to Hobart Corporation. Method and apparatus for package labeling. 4,705,588, Cl. 156-360.000.
Tremper, Alan W.: *See*—
Labaw, Clifford S.; and Tremper, Alan W., 4,705,862, Cl. 548-215.000.
Trerice, Douglas N. Method and apparatus for measurement of carbon content in fly ash. 4,705,409, Cl. 374-45.000.
Trogus, Frank J.: *See*—
Blytas, George C.; and Trogus, Frank J., 4,705,530, Cl. 44-1.00R.
Troncoso, Fernando, Jr. Compound bow draw position indicating device. 4,705,015, Cl. 124-24.00R.
Trout, Brent L.: *See*—
Navidi, Salar; Trout, Brent L.; and Wernett, Fred C., 4,706,038, Cl. 330-271.000.
Truitt, Peter G.: *See*—
Delubery, James G.; and Truitt, Peter G., 4,705,044, Cl. 128-419.00D.
TRW Inc.: *See*—
Fucci, Joseph G., 4,705,442, Cl. 411-510.000.
Trynosky, Stephen W.: *See*—
Kummer, David A.; Saenz, Jesus A.; and Trynosky, Stephen W., 4,706,079, Cl. 340-799.000.
Tschoke, Helmut: *See*—
Guntert, Josef; Hafele, Walter; and Tschoke, Helmut, 4,705,005, Cl. 123-500.000.
Tshibashi, Tamotu: *See*—
Aso, Toshiyuki; and Tshibashi, Tamotu, 4,705,932, Cl. 219-69.00V.
Tsubota, Yasumasa: *See*—
Fukunaga, Yukio; Shibahata, Yasuji; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,705,130, Cl. 180-140.000.
Shibahata, Yasuji; Fukunaga, Yukio; Nakamura, Kenji; Tsubota, Yasumasa; Irie, Namio; and Kuroki, Junsuke, 4,705,131, Cl. 180-140.000.
Tsuchitani, Masatoshi; and Nakajima, Ryoichi, to Maruzen Petrochemical Co., Ltd. Process for the preparation of an intermediate pitch for manufacturing carbon products. 4,705,618, Cl. 208-44.000.
Tsuchiya, Masuo, to Nissan Motor Company, Limited. Power steering gear. 4,705,132, Cl. 180-148.000.
Tsuchiya, Yutaka; Aoshima, Shinichirou; and Takeshima, Akira, to Hamamatsu Photonics Kabushiki Kaisha. Laser pulse train jitter measuring device. 4,705,397, Cl. 356-345.000.
Tsuda, Hiroshi: *See*—
Hashimoto, Shintaro; Morita, Akitaka; and Tsuda, Hiroshi, 4,706,288, Cl. 381-51.000.
Tsuezuki, Yoshio: *See*—
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,705,730, Cl. 430-57.000.
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,705,731, Cl. 430-57.000.
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,705,732, Cl. 430-57.000.
Saitoh, Keishi; Kanai, Masahiro; Sueda, Tetsuo; Misumi, Teruo; Tsuezuki, Yoshio; and Ogawa, Kyosuke, 4,705,733, Cl. 430-57.000.
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,705,734, Cl. 430-57.000.
Saitoh, Keishi; Sueda, Tetsuo; Ogawa, Kyosuke; Misumi, Teruo; Tsuezuki, Yoshio; and Kanai, Masahiro, 4,705,735, Cl. 430-57.000.
Tsugawa, Kazuo; and Wada, Susuma, to Akebono Brake Industry Co., Ltd.; and Akebono Research and Development Centre Ltd. Method of preventing the rust-forming and adherence between friction material and opposite friction member. 4,705,817, Cl. 523-152.000.
Tsui, Gary; and Heimbigner, Thomas, to CBC Industries, Inc. Multiposition fixture. 4,705,422, Cl. 403-60.000.
Tsuji, Katsuya; Tanimoto, Masahiro; Hirano, Akihiro; and Yamada, Takeshi, to Horiba, Ltd. Gas analyzer for simultaneously measuring many ingredients. 4,705,669, Cl. 422-93.000.
Tsuji, Shoichi: *See*—
Ito, Keiko; Ito, Michiyasu; Tsuji, Shoichi; and Suzuki, Hisatosi, 4,705,812, Cl. 521-92.000.
Ito, Keiko; Ito, Michiyasu; Tsuji, Shoichi; Suzuki, Hisatosi; and Ito, Shoichi, 4,705,813, Cl. 521-92.000.
Tsukamura, Takao, to Nittetsu Steel Drum Co., Ltd. Metal containers with seam holding end closure thereon. 4,705,184, Cl. 220-67.000.
Tuftco Corporation: *See*—
Green, Jerry T., 4,705,231, Cl. 242-130.000.
Tufte, Obert N., to Honeywell Inc. High temperature hetero-epitaxial pressure sensor. 4,706,100, Cl. 357-16.000.
Tullis, Barclay J.; Bailey, John S.; Gunawardena, D. R.; and Kaempf, Ulrich, to Hewlett-Packard Company. Apparatus for automated cassette handling. 4,705,444, Cl. 414-226.000.
Tulserate Limited: *See*—
Codd, Edwin T., 4,704,836, Cl. 52-650.000.
Turk, Gunther: *See*—
Muller, Karl-Hans; Neumuller, Matthias; and Turk, Gunther, 4,705,679, Cl. 424-52.000.
Turmag Turbo-Maschinen-AG, Nuesse & Graefer: *See*—
Ebeling, Wolfgang; and Kolditz, Helmut, 4,705,120, Cl. 175-99.000.
Turner, Albert H.: *See*—
Hayes, William V.; and Turner, Albert H., 4,705,519, Cl. 623-16.000.
Turner, Eric B.: *See*—
Schroeder, Warren W.; and Turner, Eric B., 4,705,114, Cl. 166-357.000.
Turner, Terry A. Raised panel-style door. 4,704,834, Cl. 52-311.000.
Turnpaugh, George F., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Programmable interval timer with lock means. 4,705,970, Cl. 307-600.000.
Tutikawa, Yosiji. Flat sliding door unit. 4,704,819, Cl. 49-129.000.
Ube Industries, Ltd.: *See*—
Kobayashi, Waichi, 4,705,569, Cl. 106-85.000.
Uchida, Makoto: *See*—
Kobayashi, Kazuhiro; Koboshi, Shigeharu; Kuse, Satoru; Miyaoka, Kazuyoshi; Kurematsu, Masayuki; and Uchida, Makoto, 4,705,379, Cl. 354-324.000.
Uchida, Mitsukuni: *See*—
Sakaguchi, Ushio; Nakano, Masahiro; and Uchida, Mitsukuni, 4,705,039, Cl. 128-334.00C.

Uchino, Fumio: *See*—
Karaki, Kouichi; and Uchino, Fumio, 4,706,185, Cl. 367-110.000.
Ueda, Ikuo; and Kato, Masayuki, to Fujisawa Pharmaceutical Co., Ltd. Quinazolinone derivatives, processes for the preparation thereof and pharmaceutical composition comprising the same. 4,705,787, Cl. 514-259.000.
Ueda, Sinji: *See*—
Yamada, Hirotada; Masai, Naruhito; Ueda, Sinji; Okuda, Takao; Fukasawa, Masatomo; Kato, Masuhiro; and Fukumura, Masataka, 4,705,784, Cl. 514-202.000.
Ueda, Takahisa; and Shiomi, Tomikazu, to Nippon Pillar Packing Co., Ltd. Gland packing. 4,705,722, Cl. 428-365.000.
Ueki, Toru: *See*—
Masho, Yukio; Kakimi, Shigeru; Ueki, Toru; Miyauchi, Satoshi; Ohigashi, Tugio; and Kurohata, Hitoshi, 4,705,154, Cl. 194-319.000.
Uetsuhara, Tokio, to Mitsubishi Mining & Cement Co., Ltd. Electromagnetic actuator having reluctance adjusting means. 4,706,055, Cl. 335-229.000.
Ulbrich, Walter: *See*—
Rainer, Alois; Ulbrich, Walter; and Gazsi, Lajos, 4,706,188, Cl. 364-200.000.
Ulinski, Richard J., Sr., to RJS Enterprises, Inc. Apparatus and method for optically measuring bar code dimensions. 4,705,939, Cl. 235-466.000.
Ulmer, Harry E.: *See*—
Bonfield, John H.; and Ulmer, Harry E., 4,705,904, Cl. 570-142.000.
Ulrich, Reiner: *See*—
Ripberger, Emil; Stuska, Gotthard; and Ulrich, Reiner, 4,704,950, Cl. 92-208.000.
Ulrich, Reinhard, to Daimler-Benz Aktiengesellschaft. Method for fiber optic transmission of a special coded measurement. 4,705,354, Cl. 350-96.290.
Umeyama, Satoshi: *See*—
Kodama, Mikio; Ito, Akitoshi; Yano, Motoichi; Fujiwara, Takayoshi; and Umeyama, Satoshi, 4,705,827, Cl. 525-67.000.
Undheim, Kjell: *See*—
Benneche, Tore; and Undheim, Kjell, 4,705,791, Cl. 514-274.000.
Union Carbide Corporation: *See*—
Capobianco, Paul J.; Butwell, Kenneth F.; and Kossakowski, Edward J., 4,705,673, Cl. 423-229.000.
Union Oil Company of California: *See*—
Harbolt, Bruce; Saake, James T.; and Jackson, Douglas J., 4,705,432, Cl. 406-60.000.
Switzer, Jay A., 4,706,104, Cl. 357-67.000.
Uniset Corporation: *See*—
Kopf, Rowland J., deceased; and Flynn, William C., 4,705,200, Cl. 227-9.000.
Unisys Corporation: *See*—
Mercer, Larry N., 4,706,181, Cl. 363-133.000.
United Recording Electronic Industries: *See*—
Putnam, Milton T.; and Putnam, William L., 4,706,295, Cl. 381-156.000.
United States Gypsum Company: *See*—
Wendt, Alan C., 4,704,838, Cl. 52-658.000.
United States of America
Air Force: *See*—
Aldrich, James R., 4,705,639, Cl. 210-720.000.
Jones, Edward J., 4,704,872, Cl. 62-3.000.
Commerce: *See*—
Grimes, John W., II; Jennings, Hamlin; and Brown, Paul W., 4,705,949, Cl. 250-440.100.
Energy: *See*—
Barclay, John A.; Stewart, Walter F.; Henke, Michael D.; and Kalash, Kenneth E., 4,704,871, Cl. 62-3.000.
Goers, George F., 4,705,252, Cl. 248-178.000.
Humpal, Harold H., 4,705,369, Cl. 350-636.000.
Johnson, Peter D., 4,705,987, Cl. 313-634.000.
Kelly, Michael D.; and Kramer, Daniel P., 4,705,585, Cl. 156-89.000.
Little, William E.; and McLendon, Thomas R., 4,705,108, Cl. 166-248.000.
Poeppel, Roger B.; Greenberg, Sherman; and Diercks, Dwight R., 4,705,563, Cl. 75-95.000.
Ramsey, Roswitha S.; and Todd, Richard A., 4,705,947, Cl. 250-386.000.
Ramsey, Roswitha S.; and Todd, Richard A., 4,705,948, Cl. 250-386.000.
Reedy, Robert P., 4,705,349, Cl. 350-96.150.
Navy: *See*—
Sitzmann, Michael E.; and Gilligan, William H., 4,705,899, Cl. 568-590.000.
Sutton, Donald C., 4,704,925, Cl. 81-9.400.
U.S. Philips Corporation: *See*—
Agoston, Andras; and Mattsson, Lennart P. J., 4,705,990, Cl. 315-39.550.
Den Boef, Johannes H., 4,706,023, Cl. 324-309.000.
Dieleman, Pieter J.; Goedbloed, Willem; De Jong, Roelof P.; and Oosterwijk, Theodorus M., 4,706,051, Cl. 333-212.000.
Dijkmans, Eise C.; Raets, Joseph G. G.; and Philips, Norbert J. L., 4,706,035, Cl. 330-156.000.
Dijkmans, Eise C.; Raets, Joseph G. G.; and Philips, Norbert J. L., 4,706,039, Cl. 330-297.000.
Dijkmans, Eise C., 4,706,066, Cl. 340-347.0DA.
Dohmen, Gerardus M.; Fijnvandraat, Jacob G.; and Sastra, Budiman, 4,706,146, Cl. 360-122.000.
Ganser, Hans G.; Kersten, Reinhard; Schafer, Rolf; and Stormberg, Hans P., 4,705,991, Cl. 315-209.00R.
Kettschau, Hans-Jurgen, 4,706,176, Cl. 363-21.000.
Kwiatkowski, Jean-Claude; and Imbert, Guy, 4,706,222, Cl. 365-230.000.
Magne, Francois, 4,706,092, Cl. 342-109.000.
Mastboom, Johannes G. P., 4,705,984, Cl. 313-318.000.
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Kubick, Frederick, 4,706,094, Cl. 343-754.000.
McComas, Charles C.; and Stewart, Dennis C., 4,705,203, Cl. 228-119.000.
Puffer, Leroy G.; and Erf, Robert K., 4,705,957, Cl. 250-56.00B.
Sahm, Michael K.; and Milano, Robert, 4,705,455, Cl. 416-97.00R.
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Radice, John G., 4,705,313, Cl. 294-94.000.
Ragard, Phillip A., 4,705,311, Cl. 294-2.000.
Soth, Henry J., 4,704,790, Cl. 29-838.000.
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Lehrer, Robert I.; Selsted, Michael E.; and Ganz, Tomas, 4,705,777, Cl. 514-12.000.
University of Iowa Research Foundation: *See*—
Schoenwald, Ronald D.; and Chien, Du-Shieng, 4,705,798, Cl. 514-374.000.
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Spillert, Charles R.; Suval, William D.; and Lazaro, Eric J., 4,705,756, Cl. 436-64.000.
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Dorman, Frank D.; and Wigness, Bruce D., 4,705,503, Cl. 604-50.000.
Karnavas, Alexander G.; and Estrin, Jorge A., 4,705,508, Cl. 604-113.000.
Wigness, Bruce D.; and Anderson, Michael H., 4,705,501, Cl. 604-43.000.
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Ganczarczyk, Jerzy J., 4,705,638, Cl. 210-710.000.
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Walba, David M.; and Vohra, Rohini, 4,705,874, Cl. 549-557.000.
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Polak, Anthony J.; and Petty-Weeks, Sandra, 4,705,545, Cl. 55-158.000.
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Spietschka, Ernst; and Urban, Manfred, 4,705,572, Cl. 106-288.00Q.
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Herdeg, Donald F.; and Poirier, Bruce A., 4,704,974, Cl. 112-121.120.
v. d. Ohe, Manfred: *See*—
Hespelt, Achim; and v. d. Ohe, Manfred, 4,705,292, Cl. 280-660.000.
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Potier, Michel, 4,705,104, Cl. 165-149.000.

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Craig, Clark E., 4,705,326, Cl. 312-221.000.

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Valmet-Strecker GmbH: *See*—
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Benoit, Albert J.; Boden, Dudley M.; Decker, David G.; Kishner, Stanley J.; and Van Arsdell, Robert D., 4,706,206, Cl. 364-526.000.

van Aspert, Joan J. A. M., to Askove Kunststof Industrie B.V. Detachable hose coupling. 4,705,303, Cl. 285-309.000.

van Bennekom, Peter K.; and Seal, Michael, to D. Drukker & Z.N. N.V. Method for attaching a diamond component to metal. 4,705,933, Cl. 219-121.0LC.

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Van Der Puy, Michael; Soriano, David S.; and Dimmit, Jeffrey H., to Allied Corporation. Novel extractants for the recovery of palladium. 4,705,896, Cl. 564-265.000.

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Boeckmann, Hugo; and Van Erden, Donald L., 4,704,842, Cl. 53-450.000.

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van Rijn, Dick: *See*—
Chaussy, Christian; Hepp, Wolfgang; van Rijn, Dick; and Forssmann, Bernd, 4,705,026, Cl. 128-24.00A.

van Wesenbeeck, Cornelis M. Applicator device for precision paintwork. 4,705,418, Cl. 401-15.000.

Van Zanten, Adrianus T., to U.S. Philips Corporation. Circuit for generating a substrate bias. 4,705,966, Cl. 307-296.00R.

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Beitner, Shlomo, 4,704,870, Cl. 62-3.000.

Varian Associates, Inc.: *See*—
Hlavka, Lloyd F., 4,706,029, Cl. 324-321.000.
Layman, Frederick P.; Huntley, David A.; Dick, Paul H.; Coad, George L.; Kuhlman, Michael J.; Vecta, Roger M.; and Hobson, Phillip M., 4,705,951, Cl. 250-442.100.

Vasile, Carmine F., to Hazeltine Corporation. Multifunction floating FET circuit. 4,705,967, Cl. 307-304.000.

Vasipari Kutato es Fejleszto Vallalat: *See*—
Tarnai, Gyorgy, 4,704,892, Cl. 73-1.0DV.

Vassiliadis, Theodor. Building system. 4,704,832, Cl. 52-279.000.

VDO Adolf Schindling AG: *See*—
Mayer, Klaus, 4,704,984, Cl. 116-287.000.

VE Holding Corp.: *See*—
Wyatt, William G.; and Page, Jack C., 4,704,804, Cl. 34-15.000.

Vecta, Roger M.: *See*—
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Veit GmbH & Co.: *See*—
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Vellekoop, Linda J., to Colgate-Palmolive Company. Stable dental cream in polyethylene or polypropylene container. 4,705,680, Cl. 424-55.000.

Vergara, Sossio; D'Arrigo, Sebastiano; and Imondi, Giuliano, to Texas Instruments Incorporated. High voltage pulse detector with controllable current consumption. 4,706,011, Cl. 323-274.000.

Vermeulen, Ronny, to Siemens Aktiengesellschaft. Key module with key member retained by swing members. 4,705,925, Cl. 200-340.000.

Versa Technologies, Inc.: *See*—
Schneider, Robert H., 4,704,947, Cl. 91-518.000.

Vesperman, William C.: *See*—
Choi, Jae H.; Kanotz, William M.; and Vesperman, William C., 4,705,823, Cl. 524-474.000.

Victaulic Company of America: *See*—
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Victor Company of Japan, Ltd.: *See*—
Hattori, Hiroyuki; and Morita, Akiyoshi, 4,706,075, Cl. 340-726.000.
Kashiwagi, Shigeru, 4,705,993, Cl. 315-408.000.
Tanaka, Hidenori, 4,706,137, Cl. 360-64.000.

Viers, Karen A. Breast pump. 4,705,504, Cl. 604-75.000.

Viertl, John R. M.; and Auger, Mederic E., to General Electric Company. High frequency eddy current probe with planar, spiral-like coil on flexible substrate for detecting flaws in semi-conductive material. 4,706,020, Cl. 324-238.000.

View Engineering, Inc.: *See*—
Weisner, Ralph M., 4,706,168, Cl. 362-18.000.

Vila Masot, Oscar. Circuit breaker panels with alarm system. 4,706,073, Cl. 340-639.000.

VIR, Inc.: *See*—
Rabey, Alexander; and Hampel, Herbert J., 4,705,921, Cl. 200-50.00B.

Visitec Company: *See*—
Givens, Thomas B., 4,705,035, Cl. 128-303.00R.

Vitacomm, Ltd.: *See*—
Pfohl, Robert L., 4,705,048, Cl. 128-715.000.

Vitalink Communications Corporation: *See*—
Hart, John H.; and Baker, Frederick J., 4,706,081, Cl. 340-825.030.

Vitro Tec Fideicomiso: *See*—
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Vivien, Francois: *See*—
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Voest-Alpine Automotive Gesselschaft: *See*—
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Vohra, Rohini: *See*—
Walba, David M.; and Vohra, Rohini, 4,705,874, Cl. 549-557.000.

von Broock, Ulrich, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Hydraulically damping bearing. 4,705,410, Cl. 384-99.000.

von der Embse, U. A., to Hughes Aircraft Company. Data communications receiver operable in highly stressed environments. 4,706,263, Cl. 375-96.000.

von Heimburg, Henning: *See*—
Eisenberg, Helmut; von Heimburg, Henning; Weber, Friedhelm; Beste, Achim; and Vorderbruck, Dirk, 4,705,215, Cl. 238-349.000.

von Seyerl, Joachim, to SKW Trostberg Aktiengesellschaft. Process for hardening epoxide resin masses and a hardener solution therefor. 4,705,842, Cl. 528-88.000.

Vooge, Daryl L.; and Bare, Jeffery E. Insulated building block handling tool. 4,705,312, Cl. 294-62.000.

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Eisenberg, Helmut; von Heimburg, Henning; Weber, Friedhelm; Beste, Achim; and Vorderbruck, Dirk, 4,705,215, Cl. 238-349.000.

Vossloh-Werke GmbH: *See*—
Eisenberg, Helmut; von Heimburg, Henning; Weber, Friedhelm; Beste, Achim; and Vorderbruck, Dirk, 4,705,215, Cl. 238-349.000.

Vrignaud, Dorice, to Esswein, S.A. Press tool provided with a system for guiding and relieving a metal strip. 4,704,890, Cl. 72-428.000.

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Ivanov, Mikhail A.; Komkov, Jury A.; and Fomina, Vera V., 4,705,876, Cl. 556-149.000.

W. R. Grace & Co.: *See*—
Cheng, Wu-Cheng; and Donnelly, Richard G., 4,705,767, Cl. 502-167.000.
Lin, Shiow C., 4,705,824, Cl. 524-612.000.
Spencer, Nicholas D., 4,705,771, Cl. 502-255.000.

W. R. Grace & Co., Cryovac Div.: *See*—
Owen, Dave L.; and Domnitz, David K., 4,704,843, Cl. 53-450.000.

Wada, Susuma: *See*—
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Wadhera, Anil K.; Tang, Alex K.; and Basser, Theodore E., to Northern Telecom Limited. EMI gasket retaining mechanism for electronic equipment. 4,705,916, Cl. 174-35.0GC.

Waggett, Joseph F.: *See*—
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Wagner International AG: *See*—
Boll, Hans-Joachim, 4,705,995, Cl. 318-129.000.

Wagoner, Joseph L. C., to Schlumberger Technology Corporation. Optical fiber cable construction. 4,705,353, Cl. 350-96.230.

Wahlefeld, August W.: *See*—
Willnow, Peter; Lehmann, Paul; Ziegenhorn, Joachim; and Wahlefeld, August W., 4,705,749, Cl. 435-15.000.

Wakamiya, Koichi, to Nippon Kogaku K. K. Wide angle lens. 4,705,364, Cl. 350-463.000.

Wakeman, William R., to Moore Business Forms, Inc. Business form assembly with leaders. 4,705,297, Cl. 281-2.000.

Wakita, Naomasa; and Okuda, Makoto, to NGK Spark Plug Co., Ltd. Light deflecting apparatus. 4,705,365, Cl. 350-487.000.

Walba, David M.; and Vohra, Rohini, to University Patents, Inc. Synthesis of new liquid crystal materials possessing phenylbenzoate or biphenyl core units and (2,3)-epoxyalkyloxiranemethanol chiral tails. 4,705,874, Cl. 549-557.000.
Waldemar Link GmbH & Co.: *See*—
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Waldmann, Helmut: *See*—
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Walz, Gerd: *See*—
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Wang, David W.; Casey, Donald J.; and Lehmann, Leonard T., to American Cyanamid Company. Surgical suture coating. 4,705,820, Cl. 524-381.000.
Ward, Rodney, to U.S. Philips Corporation. Electron image projector. 4,705,956, Cl. 250-492.200.
Ward, William W., to Southern Case, Inc. Drawer divider system. 4,705,168, Cl. 206-373.000.
Wardley, Michael T.; and Shirley-Fisher, David N., to NL Petroleum Products Limited. Cutter assemblies for rotary drill bits. 4,705,122, Cl. 175-329.000.
Warner, Donald F., to Heat Exchanger Industries, Inc. Flue gas reheat apparatus. 4,705,101, Cl. 165-104.310.
Warner-Lambert Company: *See*—
Bruns, Robert F., 4,705,758, Cl. 436-504.000.
Warren, Tommy M.; Winters, Warren J.; and Brett, J. Ford, to Amoco Corporation. Method and apparatus for reducing drill bit wear. 4,705,117, Cl. 175-65.000.
Waryasz, Richard E., to Combustion Engineering, Inc. Waterwall support and configuration for a ranch style fluidized bed boiler. 4,704,992, Cl. 122-4.00D.
Warzelhan, Volker; Bachl, Robert; Ball, Wolfgang; Funk, Guido; and Laun, Martin, to BASF Aktiengesellschaft. Preparation of homopolymers and copolymers of α-monolefins using a Ziegler catalyst system. 4,705,835, Cl. 526-116.000.
Watanabe, Atsuo; and Fukumitsu, Mikio, to Yamauchi Rubber Industry Co., Ltd. Press roll for paper machines. 4,704,776, Cl. 29-132.000.
Watanabe, Hideki: *See*—
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Watanabe, Hisao: *See*—
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Watanabe, Junji, to Kabushiki Kaisha Toshiba. Multi-color image forming apparatus. 4,705,394, Cl. 355-3.0DD.
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Wayne Graham & Associates International, Inc.: *See*—
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Wearn, Richard B., Jr.: *See*—
Paros, Jerome M.; Tonn, Jeffrey F.; and Wearn, Richard B., Jr., 4,706,259, Cl. 374-117.000.
Webasto-Werk W. Baier GmbH & Co.: *See*—
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Webb, Nathaniel; and Juzswik, David L., to United Technologies Automotive, Inc. Multiplex control system for memory seat or the like load. 4,706,194, Cl. 364-424.000.
Weber, Friedhelm: *See*—
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Weber, Robert W. Dual load trailer. 4,705,289, Cl. 280-414.100.
Weber, Wilhelm; Sockel, Karl H.; Achtenberg, Theo; and Sattlegger, Hans, to Bayer Aktiengesellschaft. Process for the preparation of poly(diorganosiloxanes) with alkoxy end groups. 4,705,826, Cl. 524-860.000.
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Wehinger, Egbert; Meyer, Horst; and Benz, Ulrich, to Bayer Aktiengesellschaft. Ischaemia or hypoxia controlling compositions containing pyridinecarboxylic acid esters. 4,705,794, Cl. 514-302.000.
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Weiler, Shmuel: *See*—
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Weindling, Frederik, to United Technologies Corporation. Synthetic aperture radar focusing. 4,706,089, Cl. 342-25.000.
Weir, Donald H.; Frederick, Stanley H.; Hotaling, Robert A.; and Robol, Ronald B., to Wexco Incorporated. Modular operations center for in-ground swimming pool. 4,705,629, Cl. 210-340.000.
Weisner, Ralph M., to View Engineering, Inc. Systems and methods for illuminating objects for vision systems. 4,706,168, Cl. 362-18.000.
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Wentzel, Peter; Huber, Erich; Weiss, Eckardt; and Achatz, Florian, to Siemens Aktiengesellschaft. Method for controlling a magnetic disk memory. 4,706,136, Cl. 360-39.000.
Wernett, Fred C.: *See*—
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Lin, Kou C.; Burkhardt, Charles E.; and Sheppard, Harry R., 4,705,578, Cl. 148-108.000.
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Wheelock, Barry E. Assembleable, free-standing, bed suspension apparatus. 4,704,750, Cl. 5-127.000.
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Cur, Omer N., 4,705,105, Cl. 165-151.000.
Whitaker, Herbert L., Jr.: *See*—
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Whitaker, John B., Jr., to Kershaw Manufacturing Company, Inc. Method and apparatus for reconditioning ballast along a railroad track. 4,705,115, Cl. 171-16.000.
White, Robert W., to General Electric Company. Dynamoelectric machine. 4,705,974, Cl. 310-89.000.
Whitney, Robert I.: *See*—
Slicer, Allan E.; and Whitney, Robert I., 4,705,334, Cl. 439-210.000.
Whittaker, Tony, to Allied Colloids Limited. Flocculants and processes for their preparation. 4,705,640, Cl. 210-733.000.
Whittle, Alan J., to Imperial Chemical Industries PLC. Insecticidal alkenes. 4,705,900, Cl. 568-637.000.
Widder, Rudi: *See*—
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,705,649, Cl. 260-402.000.
Wiedemann, Kurt: *See*—
Hartmann, Georg; Wiedemann, Kurt; and Zimmer, Ernst, 4,705,243, Cl. 248-51.000.
Wigness, Bruce D.; and Anderson, Michael H., to University of Minnesota, Regents of the. Bi-directional, anti-reflux vascular access system. 4,705,501, Cl. 604-43.000.
Wigness, Bruce D.: *See*—
Dorman, Frank D.; and Wigness, Bruce D., 4,705,503, Cl. 604-50.000.
Wildmoser, Alfred: *See*—
Reimann, Hans; and Wildmoser, Alfred, 4,705,634, Cl. 210-616.000.

Wilhelm, Franz: *See*—
Kern, Otto; Wilhelm, Franz; and Salamon, Ernst, 4,705,803, Cl. 514-450.000.

Wilhelmy, Egon, to Ford Motor Company. Selector shaft return guide for a multiple speed transmission. 4,704,916, Cl. 74-475.000.

Wilkinson, Philip M.: *See*—
Naylor, Geoffrey; and Wilkinson, Philip M., 4,704,858, Cl. 57-340.000.

Will, Stephen A., to McDermott Incorporated. Composite leg platform. 4,705,430, Cl. 405-227.000.

Willard, Reginald A.; and Percival, William S., to National Research Development Corporation. Waveform generator for nuclear magnetic resonance apparatus. 4,706,030, Cl. 324-322.000.

Willey, Harley M.: *See*—
Barbare, Walter L.; Willey, Harley M.; and Higgins, Ronald D., 4,706,280, Cl. 379-284.000.

Williams, Clarence O.; and Lanier, David C., to Lanier, David C. Water-powered back scrubber. 4,704,756, Cl. 15-21.00R.

Williams, Dean L., to M.G.S. Manufacturing, Inc. Flexible coupling for a wire stranding machine. 4,704,854, Cl. 57-58.340.

Williams, Leslie P., to CCA, Inc. Mixing apparatus. 4,705,405, Cl. 366-160.000.

Willnow, Peter; Lehmann, Paul; Ziegenhorn, Joachim; and Wahlefeld, August W., to Boehringer Mannheim GmbH. Process and reagent for the determination of glycerol with the use of glycerol kinase. 4,705,749, Cl. 435-15.000.

Wills, Frank E., to York International Corporation. Pulse width modulated inverter system for driving single phase a-c induction motor. 4,706,180, Cl. 363-132.000.

Wilson, Barbara M.: *See*—
Kastle, George E.; Kastle, Jennie R.; Stinedurf, Constance V.; Wilson, James E.; and Wilson, Barbara M., 4,705,276, Cl. 273-309.000.

Wilson, James E.: *See*—
Kastle, George E.; Kastle, Jennie R.; Stinedurf, Constance V.; Wilson, James E.; and Wilson, Barbara M., 4,705,276, Cl. 273-309.000.

Wilson, Larry E., to Hamilton Standard Controls, Inc. Electrical current sensor. 4,706,017, Cl. 324-127.000.

Wilson, Scott T., to Nordson Corporation. Powder spray system. 4,704,953, Cl. 98-115.200.

Winderlich, Hans-Georg: *See*—
Stockburger, Hermann; and Winderlich, Hans-Georg, 4,705,938, Cl. 235-435.000.

Windmoller & Holscher: *See*—
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Lautenschlager, Hans-Heiner; Parnham, Michael J.; Leyck, Sigurd; Winkelmann, Johannes; and Brekle, Axel, 4,705,802, Cl. 514-438.000.

Winkler, Harry L. Arc welder. 4,705,934, Cl. 219-137.0PS.

Winnik, Francoise M.: *See*—
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Winter, John P., to Presto Products, Incorporated. Polyethylene/-polyester nonoriented heat sealable moisture barrier film and bag. 4,705,707, Cl. 428-35.000.

Winternheimer, Sylvester A.: *See*—
Bussan, Marc R.; and Winternheimer, Sylvester A., 4,706,169, Cl. 362-26.000.

Winters, Warren J.: *See*—
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Wirth, Emil J., Jr., to Pfizer Inc. Wire injection nozzle. 4,705,261, Cl. 266-287.000.

Wisconsin Alumni Research Foundation: *See*—
Mosher, Deane F., 4,705,751, Cl. 435-68.000.

Witte, Kenneth G.: *See*—
Harshberger, Robert P., Jr.; Loucks, Bryan E.; and Witte, Kenneth G., 4,705,996, Cl. 318-160.000.

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Wolf, William. Bag frame. 4,705,246, Cl. 248-97.000.

Wolfe, John M.: *See*—
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Wolfgang, Eckhard: *See*—
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Wolter, Dietmar. Osteosynthesis plate for pressure stabilization. 4,705,031, Cl. 128-92.0YP.

Wong, Patrick S. L.; and Theeuwes, Felix, to ALZA Corporation. Dosage form for administering drug of the colon. 4,705,515, Cl. 604-892.000.

Wood, Christopher J.; Bradbury, David; Swan, Timothy; Segal, Michael G.; and Sellers, Robin M., to Electric Power Research Institute, Inc. Descaling process. 4,705,573, Cl. 134-3.000.

Worcester, Peter C., to Barnes Engineering Company. Narcissus correction for infrared scanning microscope. 4,705,945, Cl. 250-334.000.

Worner, Otto: *See*—
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Wusthof, Peter; and Cunningham, Sinclair, to Mannesmann Rexroth GmbH. Radial piston machine. 4,704,948, Cl. 92-58.000.

Wyatt, William O.; and Page, Jack C., to VE Holding Corp. Method of and apparatus for temperature conditioning of matter. 4,704,804, Cl. 34-15.000.

Wynberg, Hans: *See*—
Hummelen, Jan C.; Meijer, Egbert W.; and Wynberg, Hans, 4,705,847, Cl. 530-350.000.

Wynn, David K.: *See*—
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Yabe, Kiyoshi; and Onuma, Akiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Spring operating mechanism for a circuit interrupter. 4,705,144, Cl. 185-40.00R.

Yabuki, Yoshiharu: *See*—
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Yagami, Hiroyuki: *See*—
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Yaghmaie, Farrokh; Najjar, Mitri S.; and Sorell, Louis S., to Texaco Inc. Process for separating clarified water from an aqueous dispersion of ash, slag and char particulate matter. 4,705,537, Cl. 48-197.00R.

Yagita, Koji; and Ono, Yotsuo, to Asahi Medical Co., Ltd. Hollow fiber membrane formed from a block copolymer of aromatic polyester and polyoxyethylene for dialysis of blood. 4,705,632, Cl. 210-500.230.

Yamada, Hirotada; Masai, Naruhito; Ueda, Sinji; Okuda, Takao; Fukasawa, Masatomo; Kato, Masuhiro; and Fukumura, Masataka, to Sumitomo Pharmaceuticals Company, Limited. Cephem compounds. 4,705,784, Cl. 514-202.000.

Yamada, Hisashi; and Ohgoshi, Seiichi, to Kabushiki Kaisha Toshiba. Apparatus for detecting a focusing state of an optical system. 4,705,941, Cl. 250-201.000.

Yamada, Junichi, to Fuji Photo Film Co., Ltd. Image scanning apparatus. 4,706,129, Cl. 358-293.000.

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Yamada, Koji; Hashimoto, Tamotsu; Naruse, Masao; Murayama, Yo; and Ninno, Hideki. Antithrombotic agent. 4,705,805, Cl. 514-548.000.

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Yamada, Yukifumi; Terada, Takami; and Miyagawa, Toshihito, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Seat back reclining mechanism. 4,705,318, Cl. 297-362.000.

Yamagishi, Ryoji: *See*—
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Yamaguchi, Shoji; and Yamada, Kimiko, to Mitsubishi Petrochemical Co., Ltd. Copper-type conductive coating composition. 4,705,647, Cl. 252-512.000.

Yamakawa, Tadashi, to Canon Kabushiki Kaisha. Image recording apparatus utilizing light emitting diodes with pixel shape correction. 4,706,130, Cl. 358-296.000.

Yamaki, Toshio: *See*—
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Yamamoto, Hiroshi; and Akashi, Akira, to Canon Kabushiki Kaisha. Automatic focusing device. 4,705,380, Cl. 354-402.000.

Yamamoto, Kunihiko: *See*—
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Yamamoto, Michihiro; Ozato, Yukinori; Tamura, Nobuhiko; Miyagishi, Akira; and Hara, Youichi, to Sumitomo Pharmaceuticals Company,

Limited. Novel oxadiazolyl-1,4-dihydropyridines useful as antihypertensive agents. 4,705,786, Cl. 514-252.000.

Yamamoto, Yuichi; and Sameshima, Tadashi, to Terumo Kabushiki Kaisha. Immunoglobulin adsorbent and adsorption apparatus. 4,705,628, Cl. 210-289.000.

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Yamanaka, Masaaki; Inoue, Masayuki; and Asazuma, Harumitsu, to Oji Yuka Goseishi Co., Ltd. Synthetic paper of multilayer resin films. 4,705,719, Cl. 428-323.000.

Yamashita, Shuji: *See*—
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Yamatake-Honeywell Co., Ltd.: *See*—
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Yamauchi Rubber Industry Co., Ltd.: *See*—
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Yamazaki, Takao, to Neturen Co., Ltd. Cutting method to be applied to producing helical springs by cold-forming thick high-strength wire. 4,705,580, Cl. 148-154.000.

Yamazaki, Takao; and Iwase, Seiichiro, to Sony Corporation. Digital multiplying circuit. 4,706,211, Cl. 364-760.000.

Yamazaki, Tsuneo; Motte, Shunichi; and Shimbo, Masafumi, to Seiko Instruments & Electronics Ltd. Substrate for active matrix display. 4,705,358, Cl. 350-334.000.

Yan, Tsoung Y., to Mobil Oil Corporation. Cetane number of diesel fuel by incorporating polynitrate esters and stabilizers. 4,705,534, Cl. 44-57.000.

Yan, Tsoung-Y, to Mobil Oil Corporation. Process for the separation of para-xylene. 4,705,909, Cl. 585-828.000.

Yang, Ren-Der; Hamilton, Edwin J., Jr.; and Taber, Larry D., to International Minerals & Chemical Corp. Isolation of bioactive, monomeric growth hormone. 4,705,848, Cl. 530-399.000.

Yano, Motoichi: *See*—
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Yates, Chester R.; and Bruner, Maurice M., to Leggett & Platt, Incorporated. Box spring assembly with modular twin continuous spring elements. 4,704,752, Cl. 5-247.000.

Yazaki Corporation: *See*—
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Ye Data Inc.: *See*—
Mizukami, Hidetada; Urata, Tsutomu; Nakagawa, Takashi; Hashimoto, Kunihiro; and Mizoguchi, Toshiaki, 4,705,279, Cl. 279-1.00L.

Yiannoulos, Aristides A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Protection of inductive load switching transistors from inductive surge created overvoltage conditions. 4,705,322, Cl. 361-91.000.

Yoda, Kiyoshi; Itagaki, Hidenobu; and Fujimura, Satoshi, to Mitsubishi Denki Kabushiki Kaisha. NMR imaging method. 4,706,028, Cl. 324-309.000.

Yoda, Yoshiro, to Olympus Optical Co., Ltd. Slice level corrector. 4,706,236, Cl. 369-59.000.

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Yoshida, Kinji; and Iura, Kazuo, to Sumitomo Wiring Systems, Ltd. Wire twisting device. 4,704,855, Cl. 57-58.540.

Yoshida Kogyo K.K.: *See*—
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Yoshida, Manabu: *See*—
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Yoshino, Yasuhisa; Kago, Yoshiyuki; Sakakibara, Hiroyuki; and Shinoda, Yoshio, to Nippon Soken, Inc.; and Nippondenso Co., Ltd. Speed control system for a motor vehicle. 4,706,195, Cl. 364-426.000.

Yoshioka, Hiroshi: *See*—
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Yoshioka, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Data transmission apparatus. 4,706,247, Cl. 370-85.000.

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Yost, George P. Universal gutter mounting system. 4,705,242, Cl. 248-48.100.

Young, David C. Abrading material. 4,704,757, Cl. 15-104.940.

Young, Patrick. TV schedule system and process. 4,706,121, Cl. 358-142.000.

Young, Peter L.; Cech, Jay; and Li, Kin, to Gould Inc. Thin-film electrical connections for integrated circuits. 4,705,606, Cl. 204-15.000.

Yu, Philip S.: *See*—
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Yu, Yuan-Fu: *See*—
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Zabrodski, William J.: *See*—
Nichols, Richard W.; Zabrodski, William J.; and Mitra, Abhijit, 4,705,902, Cl. 568-810.000.

Zacharias, Ernst, to Matt H. Hohner AG. Mouth organ. 4,704,938, Cl. 84-377.000.

Zahnradfabrik Friedrichshafen, AG.: *See*—
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Zamboni, Richard F., to Frank J. Zamboni & Co. Inc. Ice resurfacing machine blade holder. 4,705,320, Cl. 299-24.000.

Zeidler, Ulrich: *See*—
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Zeiler, Hans-Joachim: *See*—
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Zeisel, Eva: *See*—
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Zelenka, Terence: *See*—
Locacius, Robert F.; and Zelenka, Terence, 4,705,278, Cl. 277-235.00B.

Zemgals, Edvin: *See*—
Sjostrom, Douglas D.; and Zemgals, Edvin, 4,705,038, Cl. 128-305.000.

Zengel, Hans-Georg: *See*—
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Zenith Electronics Corporation: *See*—
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Citta, Richard W.; Mutzabaugh, Dennis M.; and Sgrignoli, Gary J., 4,706,284, Cl. 380-12.000.
Dietch, Leonard, 4,705,357, Cl. 350-322.000.
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Zichner, Botho: *See*—
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Willnow, Peter; Lehmann, Paul; Ziegenhorn, Joachim; and Wahlefeld, August W., 4,705,749, Cl. 435-15.000.

Ziemba, Anthony. Deer hunter's tree seat. 4,705,143, Cl. 182-187.000.

Zimmer, Ernst, to Kuka Schweissanlagen+ Roboter GmbH. Rack drive. 4,704,913, Cl. 74-89.170.

Zimmer, Ernst: *See*—
Hartmann, Georg; Wiedemann, Kurt; and Zimmer, Ernst, 4,705,243, Cl. 248-51.000.

Zimmerman, Carol J., to Exxon Production Research Company. Method for determining the position of a subterranean reflector from a traveltime curve. 4,706,225, Cl. 367-38.000.

Zimmerman, Sanford S.; and Syarto, Louis W., to Wesflex International Corporation. Machining center having an inclinable vacuum-holding worktable. 4,705,438, Cl. 409-132.000.

Zindler, Hugh A., to Valley Industries, Inc. Clutch brake assembly. 4,705,148, Cl. 192-8.00R.

Zink, Rudolf; and Fletcher, Ian J., to Ciba-Geigy Corporation. Recording material employing chromogenic bisquinazolines. 4,705,775, Cl. 503-218.000.

Zobbi, Robert G.; and Michaud, Mark, to Rem Chemicals, Inc. Composition and method for metal surface refinement. 4,705,594, Cl. 156-637.000.

Zogg, Robert A.; Robertson, Gerald F.; and Brown, Will C., to Carrier Corporation. Internally enhanced tubes. 4,705,103, Cl. 165-110.000.

Zoleski, Benjamin H.: *See*—
Sung, Rodney L.; Zoleski, Benjamin H.; and O'Rourke, Ronald L., 4,705,642, Cl. 252-47.500.

Zorcom Enterprise, Inc.: *See*—
Nadeau, Richard P., 4,705,268, Cl. 272-72.000.

Zuber, Bretislav P., to Northern Telecom Limited. Method and apparatus for supporting an article of indefinite length. 4,705,583, Cl. 156-52.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF NOVEMBER, 1987

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Advanced Interconnections, Inc.: *See*—
Murphy, James V., Re. 32,540, Cl. 206-329.000.
Cassano, James R.: *See*—
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., Re. 32,541, Cl. 271-3.000.
Couture, Paul A.: *See*—
Jentoft, Arthur P.; and Couture, Paul A., Re. 32,539, Cl. 52-200.000.
Dubner Computer Systems, Inc.: *See*—
Korman, Nathaniel I., Re. 32,544, Cl. 358-28.000.
Hamlin, Thomas J.: *See*—
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., Re. 32,541, Cl. 271-3.000.
Hawkswell, Victor T., to USM Corporation. Head for handling electrical components. Re. 32,538, Cl. 29-740.000.
Ima, Seiichiro: *See*—
Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; Naito, Yukio; and Ima, Seiichiro, Re. 32,542, Cl. 428-512.000.
Jentoft, Arthur P.; and Couture, Paul A., to Wasco Products, Inc. Skylight construction. Re. 32,539, Cl. 52-200.000.
Kakugo, Masahiro: *See*—
Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; Naito, Yukio; and Ima, Seiichiro, Re. 32,542, Cl. 428-512.000.
Korman, Nathaniel I., to Dubner Computer Systems, Inc. Selective color modification. Re. 32,544, Cl. 358-28.000.
Matsuyama, Kiyoshi: *See*—
Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; Naito, Yukio; and Ima, Seiichiro, Re. 32,542, Cl. 428-512.000.
Murphy, James V., to Advanced Interconnections, Inc. Terminal positioning method and construction. Re. 32,540, Cl. 206-329.000.
Naito, Yukio: *See*—
Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; Naito, Yukio; and Ima, Seiichiro, Re. 32,542, Cl. 428-512.000.
Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; Naito, Yukio; and Ima, Seiichiro, to Sumitomo Chemical Company, Limited. Molded products of polypropylene. Re. 32,542, Cl. 428-512.000.
Smith, Richard E.: *See*—
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., Re. 32,541, Cl. 271-3.000.
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., to Xerox Corporation. Fluidic feeding of documents to an exposure station. Re. 32,541, Cl. 271-3.000.
Sumitomo Chemical Company, Limited: *See*—
Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; Naito, Yukio; and Ima, Seiichiro, Re. 32,542, Cl. 428-512.000.
Urban Transportation Development Corp., Ltd.: *See*—
Williamson, Dennis F., Re. 32,543, Cl. 318-376.000.
USM Corporation: *See*—
Hawkswell, Victor T., Re. 32,538, Cl. 29-740.000.
Wasco Products, Inc.: *See*—
Jentoft, Arthur P.; and Couture, Paul A., Re. 32,539, Cl. 52-200.000.
Williamson, Dennis F., to Urban Transportation Development Corp., Ltd. Braking control. Re. 32,543, Cl. 318-376.000.
Xerox Corporation: *See*—
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., Re. 32,541, Cl. 271-3.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

AMP Incorporated: *See*—
Lucius, John E., B1 4,385,794, Cl. 439-399.000.
Erjavec, Eugene V.: *See*—
Louis, Timothy R.; Gedeon, Carl A.; Lee, Maw H.; and Erjavec, Eugene V., B1 4,414,634, Cl. 364-510.000.
Essex International, Inc.: *See*—
Vogel, Ralph A., B1 3,682,234, Cl. 164-433.000.
Gedeon, Carl A.: *See*—
Louis, Timothy R.; Gedeon, Carl A.; Lee, Maw H.; and Erjavec, Eugene V., B1 4,414,634, Cl. 364-510.000.
Lee, Maw H.: *See*—
Louis, Timothy R.; Gedeon, Carl A.; Lee, Maw H.; and Erjavec, Eugene V., B1 4,414,634, Cl. 364-510.000.
Louis, Timothy R.; Gedeon, Carl A.; Lee, Maw H.; and Erjavec, Eugene V., to Scott & Fetzer Company, The. Fluid flow totalizer. B1 4,414,634, 11-10-87, Cl. 364-510.000.
Lucius, John E., to AMP Incorporated. Insulation displacement terminal. B1 4,385,794, 11-10-87, Cl. 439-399.000.
Matsumoto, Hiroyuki, to Tsukasa Kasei Kogyo Kabushiki Kaisha. Polypropylene strap and method of manufacturing the same. B1 4,451,524, 11-10-87, Cl. 428-213.000.
Scott & Fetzer Company, The: *See*—
Louis, Timothy R.; Gedeon, Carl A.; Lee, Maw H.; and Erjavec, Eugene V., B1 4,414,634, Cl. 364-510.000.
Telesonics, Inc.: *See*—
Wegner, Carl R., B1 4,048,654, Cl. 358-144.000.
Tsukasa Kasei Kogyo Kabushiki Kaisha: *See*—
Matsumoto, Hiroyuki, B1 4,451,524, Cl. 428-213.000.
Vogel, Ralph A., to Essex International, Inc. Structure for the continuous casting of metal bars. B1 3,682,234, 11-10-87, Cl. 164-433.000.
Wegner, Carl R., to Telesonics, Inc. Stereophonic television sound transmission system. B1 4,048,654, 11-10-87, Cl. 358-144.000.

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A/S Nunc: *See*—
Lovborg, Uffe, 292,735, Cl. D24-29.000.
ABLE Computer: *See*—
DeVita, Joseph P.; and Mulder, Thomas J., 292,698, Cl. D13-12.000.
Aktiebolaget Bahco Verktyg: *See*—
Jansson, Erik C.; Brunosson, Bengt B.; and Johansson, Jan-Erik, 292,666, Cl. D8-22.000.
Alberts, Jerome B. Combination food processor disc blade and accessory holder. 292,662, 11-10-87, Cl. D7-74.000.
Albitz-Pitini, Jeanne: *See*—
Pitini, Paul, II; and Albitz-Pitini, Jeanne, 292,646, Cl. D3-48.000.
Altop S.A.: *See*—
Jordi, Urs M., 292,677, Cl. D10-31.000.
American Cyanamid Company: *See*—
Morris, Edward; and Woodruff, Keith, 292,674, Cl. D9-439.000.
Woodruff, Keith; and Morris, Edward, 292,673, Cl. D9-439.000.
Amity Leather Products: *See*—
Young, Raymond W., 292,645, Cl. D3-39.000.
Aono, Tetsuya, to Maruzen Sewing Machine Co., Ltd. Sewing machine. 292,712, 11-10-87, Cl. D15-70.000.
Arney, Michel D., to Wang Laboratories, Inc. Keyboard. 292,708, 11-10-87, Cl. D14-100.000.

Audio Technica U.S., Inc.: *See—*
White, Jeffrey N.; and Reichel, Kenneth R., 292,702, Cl. D14-33.000.

Belaiche, Serge; and Ebbo, Daniel, to Serdaneli. Faucet handle. 292,730, 11-10-87, Cl. D23-250.000.

Berkus, Barry A. Modular building. 292,736, 11-10-87, Cl. D25-1.000.

Bjorkman, Jimmy, to Tage Bjorkman & Son AB. Frame corner joint. 292,671, 11-10-87, Cl. D8-382.000.

Brown, Vera: *See—*
Shapiro, Mervyn H.; Brown, Vera; and Fishman, Yoram, 292,711, Cl. D15-83.000.

Brunosson, Bengt B.: *See—*
Jansson, Erik C.; Brunosson, Bengt B.; and Johansson, Jan-Erik, 292,666, Cl. D8-22.000.

Buckhorn Material Handling Group Inc.: *See—*
Stein, Eric D., 292,718, Cl. D19-92.000.

Bulgari, Marina, to Marina B Creation S.A. Ring. 292,682, 11-10-87, Cl. D11-27.000.

Bulgari, Marina, to Marina B Creation S.A. Ring. 292,683, 11-10-87, Cl. D11-34.000.

Bulgari, Marina, to Marina B. Creation S.A. Ring. 292,684, 11-10-87, Cl. D11-34.000.

Bulgari, Marina, to Marina B Creation S.A. Earring. 292,685, 11-10-87, Cl. D11-40.000.

Bulgari, Marina, to Marina B. Creaton S. A. Earring. 292,686, 11-10-87, Cl. D11-40.000.

Casio Computer Co., Ltd.: *See—*
Takeichi, Takashi, 292,678, Cl. D10-39.000.

Cattaneo, Marco, to MOMO S.p.A. Vehicle wheel. 292,693, 11-10-87, Cl. D12-211.000.

CertainTeed Corporation: *See—*
Reisinger, Ludwig; and Westphal, Dennis, 292,737, Cl. D25-125.000.

Chan, Raymond, to Integrated Display Technology Limited. Thermometer. 292,680, 11-10-87, Cl. D10-57.000.

Church, Laurene J.: *See—*
Church, Ronald L.; and Church, Laurene J., 292,653, Cl. D6-333.000.

Church, Ronald L.; and Church, Laurene J. Portable infant restraint. 292,653, 11-10-87, Cl. D6-333.000.

Clubb, Ardith A.: *See—*
Jernander, Steve; and Clubb, Ardith A., 292,641, Cl. D2-244.000.

Counterstress Products, Inc.: *See—*
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Delta International Machinery Corp.: *See—*
Miller, David, 292,713, Cl. D15-133.000.

DeVita, Joseph P.; and Mulder, Thomas J., to ABLE Computer. Circuit board. 292,698, 11-10-87, Cl. D13-12.000.

Dick, H. Wayne; and Shoemaker, John B., to PPG Industries, Inc. Yarn bobbin. 292,643, 11-10-87, Cl. D3-24.000.

Domon, Yoshihiro: *See—*
Futatsugi, Mitsuyuki; Domon, Yoshihiro; and Yamazaki, Hitoshi, 292,738, Cl. D26-3.000.

Drever, Leslie C. Microphone wind shroud. 292,701, 11-10-87, Cl. D14-12.000.

Duell, Graham, to Nicholas Kiwi (Pacific) Pty. Limited. Combined container and applicator for liquid shoe polish or similar article. 292,672, 11-10-87, Cl. D9-338.000.

Ebbo, Daniel: *See—*
Belaiche, Serge; and Ebbo, Daniel, 292,730, Cl. D23-250.000.

Engleman, Thomas W. Paint brush having a manually operated handle pump connected by tubing to a paint container. 292,649, 11-10-87, Cl. D4-114.000.

Envall, Bjorn E. A., to Saab-Scania Aktiebolag. Wheel. 292,691, 11-10-87, Cl. D12-206.000.

Espinoza, Raymond P.; and Wooten, Patrick R. Combined multi-section rear view mirror and anti-glare visor. 292,689, 11-10-87, Cl. D12-188.000.

Evans, James A. Mobile traffic signal. 292,681, 11-10-87, Cl. D10-115.000.

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Fahy, Lawrence T. Universal antenna mount. 292,707, 11-10-87, Cl. D14-91.000.

Ferdinand Alexander Porsche: *See—*
Tragatschnig, Joerg, 292,703, Cl. D14-53.000.

Fieldcrest Cannon, Inc.: *See—*
Kester, Melvin E., 292,658, Cl. D6-465.000.

Fincher, Fred T. Combined lie level and attachment strap. 292,679, 11-10-87, Cl. D10-69.000.

Fischer, Roy K., to Validec, Inc. Wireless hand-held communications terminal. 292,706, 11-10-87, Cl. D14-68.000.

Fishman, Yoram: *See—*
Shapiro, Mervyn H.; Brown, Vera; and Fishman, Yoram, 292,711, Cl. D15-83.000.

Fomby, Kenneth A., to K & D Plastics, Inc. Bandage roller. 292,669, 11-10-87, Cl. D8-359.000.

Fukuchi, Eiji, to Mitsuboshi Belting Ltd. Bicycle tire. 292,688, 11-10-87, Cl. D12-147.000.

Futatsugi, Mitsuyuki; Domon, Yoshihiro; and Yamazaki, Hitoshi, to Mitsubishi Denki Kabushiki Kaisha. Fluorescent lamp. 292,738, 11-10-87, Cl. D26-3.000.

Gagliardi, Eugene D., Jr., to Southdown Meat Company. Meat product. 292,640, 11-10-87, Cl. D1-199.000.

Gates, Jon G.; Kolada, Paul P.; and Valentino, Michael W., to Kohler Co. Pedestal lavatory. 292,732, 11-10-87, Cl. D23-292.000.

General Research of Electronics, Inc.: *See—*
Imazeki, Kazuyoshi, 292,704, Cl. D14-68.000.

Gerity Products, Inc.: *See—*
Murtagh, William O., 292,717, Cl. D19-84.000.

GNB Incorporated: *See—*
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Gomez, Jesus, to Fabricas Orion S.A. Faucet handle. 292,731, 11-10-87, Cl. D23-254.000.

Hall, Grace R.: *See—*
Hall, Nathaniel; and Hall, Grace R., 292,644, Cl. D3-35.000.

Hall, Nathaniel; and Hall, Grace R. Cassette tape storage cabinet. 292,644, 11-10-87, Cl. D3-35.000.

Hallgren, Wayne F. Aeronautical template. 292,716, 11-10-87, Cl. D19-37.000.

Heavner, Robert E. Oil filter remover. 292,665, 11-10-87, Cl. D8-14.000.

Hendrick, William B., to Mueller Furniture Corporation. Swivel chair. 292,655, 11-10-87, Cl. D6-366.000.

Hill, Michael A., to Hill Products Limited. Desk calendar. 292,715, 11-10-87, Cl. D19-25.000.

Hill Products Limited: *See—*
Hill, Michael A., 292,715, Cl. D19-25.000.

Hollinrake, Thomas J.: *See—*
Robinson, Michael B.; and Hollinrake, Thomas J., 292,733, Cl. D23-295.000.

Imazeki, Kazuyoshi, to General Research of Electronics, Inc. Marine transceiver. 292,704, 11-10-87, Cl. D14-68.000.

Integrated Display Technology Limited: *See—*
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Izant, David. Coin organizer. 292,739, 11-10-87, Cl. D99-34.000.

Jansson, Erik C.; Brunosson, Bengt B.; and Johansson, Jan-Erik, to Aktiebolaget Bahco Verktyg. Adjustable spanner wrench. 292,666, 11-10-87, Cl. D8-22.000.

Jernander, Steve; and Clubb, Ardith A. Cap for bubble blowing. 292,641, 11-10-87, Cl. D2-244.000.

Johansson, Jan-Erik: *See—*
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Johnson, Stanley A., to Vollrath Company, The. Ladle. 292,663, 11-10-87, Cl. D7-104.000.

Jones, Doris R.: *See—*
Jones, William H.; and Jones, Doris R., 292,726, Cl. D21-185.000.

Jones, William H.; and Jones, Doris R. Mayfly nymph. 292,726, 11-10-87, Cl. D21-185.000.

Jordi, Urs M., to Altop S.A. Attachable watch. 292,677, 11-10-87, Cl. D10-31.000.

K & D Plastics, Inc.: *See—*
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Kenner Parker Toys Inc.: *See—*
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Zacherle, Bonnie, 292,721, Cl. D21-163.000.
Zacherle, Bonnie, 292,722, Cl. D21-171.000.
Zacherle, Bonnie, 292,723, Cl. D21-171.000.
Zacherle, Bonnie, 292,725, Cl. D21-177.000.
Zacherle, Bonnie, 292,727, Cl. D21-187.000.

Kester, Melvin E., to Fieldcrest Cannon, Inc. Modular display rack. 292,658, 11-10-87, Cl. D6-465.000.

Knutson, Ken M. Spare tire mounting bracket. 292,690, 11-10-87, Cl. D12-202.000.

Kohler Co.: *See—*
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Kolada, Paul P.: *See—*
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Kosako, Mikio, to Sharp Corporation. Input/output computer terminal. 292,709, 11-10-87, Cl. D14-100.000.

Kurcbart, Roberto: *See—*
Scheid, William J.; McKee, John M.; and Kurcbart, Roberto, 292,705, Cl. D14-68.000.

Lacey, Edward H. Food tray. 292,661, 11-10-87, Cl. D7-38.000.

Landecker, David J. Bottle pump cap. 292,675, 11-10-87, Cl. D9-449.000.

Lee, Lawrence L. Rope fastener. 292,668, 11-10-87, Cl. D8-356.000.

Lee, William A.: *See—*
Smith, Richard W.; and Lee, William A., 292,692, Cl. D12-211.000.

Levin, Rona M. Padded bicycle seat cover. 292,660, 11-10-87, Cl. D6-502.000.

Lovborg, Uffe, to A/S Nunc. Tube for the immunological adsorption analysis. 292,735, 11-10-87, Cl. D24-29.000.

Ludwig, Edward E. Roller skate. 292,729, 11-10-87, Cl. D21-226.000.

M. Grumbacher, Inc.: *See—*
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Maass, Jorge A. Combined audio and video vending machine. 292,719, 11-10-87, Cl. D20-1.000.

Marina B Creation S.A.: *See—*
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Bulgari, Marina, 292,683, Cl. D11-34.000.
Bulgari, Marina, 292,684, Cl. D11-34.000.
Bulgari, Marina, 292,685, Cl. D11-40.000.

Marina B. Creaton S. A.: *See—*
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Marona, Robert N.: *See—*
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Marten, Voogd. Watercraft. 292,695, 11-10-87, Cl. D12-316.000.

Maruzen Sewing Machine Co., Ltd.: *See—*
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Mileto, Sal. Cup lid. 292,676, 11-10-87, Cl. D9-454.000.
Miller, David, to Delta International Machinery Corp. Scroll saw. 292,713, 11-10-87, Cl. D15-133.000.
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MOMO S.p.A.: *See*—
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Morris, Edward; and Woodruff, Keith, to American Cyanamid Company. Cap for a container. 292,674, 11-10-87, Cl. D9-439.000.
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Motorola, Inc.: *See*—
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Mueller Furniture Corporation: *See*—
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Muller, Ronald L.; and Rakocy, William J., to North American Philips Corporation. Lighted make-up mirror. 292,652, 11-10-87, Cl. D6-308.000.
Murtagh, William O., to Gerity Products, Inc. Desk accessory. 292,717, 11-10-87, Cl. D19-84.000.
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Pesonen, Ari P. Hook for an earring. 292,687, 11-10-87, Cl. D11-88.000.
Pitini, Paul, II; and Albitz-Pitini, Jeanne. Multiple pouch tote bag. 292,646, 11-10-87, Cl. D3-48.000.
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Remington, Robert W., to Wimer, Claude R., Jr. Combined rear holster and belt. 292,647, 11-10-87, Cl. D3-101.000.
Remington, Robert W., to Wimer, Claude R., Jr. Combined balanced holster and belt. 292,648, 11-10-87, Cl. D3-101.000.
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Sahli, Richard M., to GNB Incorporated. Combined battery and detachable handle. 292,696, 11-10-87, Cl. D13-8.000.
Scheid, William J.; McKee, John M.; and Kurcbart, Roberto, to Motorola, Inc. Display pager or similar article. 292,705, 11-10-87, Cl. D14-68.000.
Schmitz, Bertram. Combination lint remover and shoe polisher. 292,650, 11-10-87, Cl. D4-137.000.
Seegmiller, Ben L. Connector for a single strut mine roof truss. 292,670, 11-10-87, Cl. D8-382.000.
Selig, Julie A., to 'totes', incorporated. Umbrella handle. 292,642, 11-10-87, Cl. D3-12.000.
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Shapiro, Mervyn H.; Brown, Vera; and Fishman, Yoram. Portable refrigerator. 292,711, 11-10-87, Cl. D15-83.000.
Sharp Corporation: *See*—
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Shoemaker, John B.: *See*—
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Simpson, Harold N. Locking pin. 292,667, 11-10-87, Cl. D8-330.000.
Smith, Richard W.; and Lee, William A., to Motor Wheel Corporation. Wheel. 292,692, 11-10-87, Cl. D12-211.000.
Southdown Meat Company: *See*—
Gagliardi, Eugene D., Jr., 292,640, Cl. D1-199.000.
Stein, Eric D., to Buckhorn Material Handling Group Inc. Document box. 292,718, 11-10-87, Cl. D19-92.000.
Stratton, Kent E. Multi-picture display frame. 292,651, 11-10-87, Cl. D6-301.000.
Svezia, John; and Marona, Robert N., to M. Grumbacher, Inc. Display module for booklets and the like. 292,659, 11-10-87, Cl. D6-468.000.
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Tragatschnig, Joerg, to Ferdinand Alexander Porsche. Telephone set. 292,703, 11-10-87, Cl. D14-53.000.
Valentino, Michael W.: *See*—
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Vinal, Peter S., to Northern Telecom Limited. Dual male pin connector. 292,699, 11-10-87, Cl. D13-24.000.
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Wang Laboratories, Inc.: *See*—
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Westphal, Dennis: *See*—
Reisinger, Ludwig; and Westphal, Dennis, 292,737, Cl. D25-125.000.
White, Jeffrey N.; and Reichel, Kenneth R., to Audio Technica U.S., Inc. Speaker. 292,702, 11-10-87, Cl. D14-33.000.
Wightman, Paul D. Wine rack. 292,657, 11-10-87, Cl. D6-462.000.
Wilkinson, William T. Exercising device for simulating climbing. 292,728, 11-10-87, Cl. D21-191.000.
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Woodruff, Keith; and Morris, Edward, to American Cyanamid Company. Cap for a container. 292,673, 11-10-87, Cl. D9-439.000.
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Yajima, Setsuo, to Ricoh Company, Ltd. Type cartridge for printer. 292,714, 11-10-87, Cl. D18-22.000.
Yamazaki, Hitoshi: *See*—
Futatsugi, Mitsuyuki; Domon, Yoshihiro; and Yamazaki, Hitoshi, 292,738, Cl. D26-3.000.
Young, Raymond W., to Amity Leather Products. Bag. 292,645, 11-10-87, Cl. D3-39.000.
Zacherle, Bonnie, to Kenner Parker Toys Inc. Toy figure. 292,720, 11-10-87, Cl. D21-161.000.
Zacherle, Bonnie, to Kenner Parker Toys Inc. Toy figure. 292,721, 11-10-87, Cl. D21-163.000.
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CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 10, 1987

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

21	4,704,742
159	4,704,743
174	4,704,744
268	4,704,745
424	4,704,746

CLASS 4

321	4,704,747
420.4	4,704,748

CLASS 5

81 B	4,704,749
127	4,704,750
236 R	4,704,751
247	4,704,752
484	4,704,753

CLASS 8

471	4,705,521
	4,705,522
490	4,705,523
527	4,705,524
555	4,705,525
	4,705,526
558	4,705,527
641	4,705,528

CLASS 14

20	4,704,754

CLASS 15

3.13	4,704,755
21 R	4,704,756
104.94	4,704,757
144 B	4,704,758
160	4,704,759
218.1	4,704,760
250.19	4,704,761
250.42	4,704,762
262	4,704,763
301	4,704,764
323	4,704,765

CLASS 16

236	4,704,766
388	4,704,767

CLASS 17

11	4,704,768
46	4,704,769

CLASS 23

293 R	4,705,529

CLASS 24

431	4,704,770
574	4,704,771
669	4,704,772

CLASS 29

25.35	4,704,774
27 C	4,704,773
33 M	4,704,775
132	4,704,776
148.3	4,704,777
235	4,704,778
240	4,704,779
252	4,704,780
408	4,704,781
434	4,704,782
596	4,704,787
603	4,704,788
609	4,704,789
740	Re.32,538
741	4,704,792
838	4,704,790
852	4,704,791

CLASS 30

133	4,704,794
169	4,704,795
187	4,704,793

CLASS 33

1 B	4,704,796
18.1	4,704,797
138	4,704,798
179.5 R	4,704,799
265	4,704,800
502	4,704,801
556	4,704,802

CLASS 34

9	4,704,803
15	4,704,804
31	4,704,805
54	4,704,806
201	4,704,807

CLASS 36

102	4,704,808
127	4,704,809
130	4,704,810

CLASS 37

80 A	4,704,811
141 R	4,704,812

CLASS 40

11 R	4,704,813
152.1	4,704,814

CLASS 43

4	4,704,815
17	4,704,816
57.3	4,704,817

CLASS 44

1 R	4,705,530
	4,705,531
51	4,705,533
53	4,705,532
57	4,705,534

CLASS 47

62	4,704,818

CLASS 48

77	4,705,535
197 R	4,705,536
	4,705,537
	4,705,538
	4,705,539

CLASS 49

129	4,704,819
441	4,704,820
446	4,704,821
502	4,704,822

CLASS 51

110	4,704,823
281 R	4,704,824
290	4,704,825
411	4,704,826

CLASS 52

34	4,704,827
107	4,704,828
127.2	4,704,829
200	Re.32,539
226	4,704,830
235	4,704,831
279	4,704,832
309.2	4,704,833
311	4,704,834
486	4,704,835
631	4,704,837
650	4,704,836
658	4,704,838
732	4,704,839
741	4,704,840

CLASS 53

448	4,704,841
450	4,704,842
	4,704,843
453	4,704,844
482	4,704,845
522	4,704,846

CLASS 55

16	4,705,540
26	4,705,541
93	4,705,542
158	4,705,543
	4,705,544
	4,705,545
182	4,705,546
374	4,705,547

CLASS 56

10.5	4,704,847
17.2	4,704,848
17.5	4,704,849
119	4,704,850
328 TS	4,704,851
400.14	4,704,852

CLASS 57

58.34	4,704,854
58.54	4,704,855
228	4,704,856
264	4,704,857
340	4,704,858
401	4,704,853
	4,704,859
	4,704,860

CLASS 60

39.32	4,704,861
226.2	4,704,862
311	4,704,863
330	4,704,864
405	4,704,865
449	4,704,866
554	4,704,867
620	4,704,868
751	4,704,869

CLASS 62

3	4,704,870
	4,704,871
	4,704,872
22	4,705,548
30	4,705,549
64	4,704,873
187	4,704,874
372	4,704,875
388	4,704,876
532	4,704,877

CLASS 63

14 R	4,704,878

CLASS 65

32	4,705,550
60.1	4,705,551
158	4,705,552

CLASS 68

140	4,704,879

CLASS 70

120	4,704,880
158	4,704,881
215	4,704,882
232	4,704,883
337	4,704,884

CLASS 71

76	4,705,553
88	4,705,554
90	4,705,555
	4,705,556
92	4,705,557
	4,705,558

CLASS 72

50	4,704,885
57	4,704,886
347	4,704,887
391	4,704,888
428	4,704,889
	4,704,890

CLASS 73

1 DV	4,704,892
1 G	4,704,893
1 R	4,704,891
35	4,704,894
37.9	4,704,896
40.5 R	4,704,897
54	4,704,898
61 R	4,704,899
104	4,704,895
146	4,704,900
146.8	4,704,901
149	4,704,902
159	4,704,903
204	4,704,904
596	4,704,905
660	4,704,906
861.17	4,704,907
	4,704,908
862.04	4,704,909
863.21	4,704,910
865.5	4,704,911

CLASS 74

89.15	4,704,912
89.17	4,704,913
411.5	4,704,914
471 XY	4,704,915
475	4,704,916
	4,704,917
579. R	4,704,918
594.1	4,704,919
665 GC	4,704,920
714	4,704,921
733	4,704,922
785	4,704,923

CLASS 75

0.5 AA	4,705,559
0.5 B	4,705,560
58	4,705,561
83	4,705,562
95	4,705,563
120	4,705,564
235	4,705,565

CLASS 81

3.4	4,704,924
9.4	4,704,925
451	4,704,929

CLASS 82

36 A	4,704,926

CLASS 83

13	4,704,927
24	4,704,930
175	4,704,928

CLASS 84

1.01	4,704,931
1.03	4,704,932
	4,704,933
94.2	4,704,934
312 P	4,704,935
313	4,704,936
339	4,704,937
377	4,704,938
385 P	4,704,939
425	4,704,940
464 A	4,704,941

CLASS 89

1.11	4,704,942
36.02	4,704,943
132	4,704,944
185	4,704,945

CLASS 91

7	4,704,946
518	4,704,947

CLASS 92

58	4,704,948
160	4,704,949
208	4,704,950

CLASS 98

1.5	4,704,951
115.2	4,704,952
	4,704,953

CLASS 99

279	4,704,954
339	4,704,955
427	4,704,956
451	4,704,957
470	4,704,958
538	4,704,959

CLASS 101

93.12	4,704,960
114	4,704,961
269	4,704,962
425	4,704,963
	4,704,964

CLASS 102

226	4,704,965
334	4,704,966
	4,704,967
517	4,704,968

CLASS 105

148	4,704,969

CLASS 106

3	4,705,566
20	4,705,567
26	4,705,568
85	4,705,569
124	4,705,570
287.1	4,705,571
288 Q	4,705,572

CLASS 109

73	4,704,970

CLASS 110

264	4,704,971
345	4,704,972

CLASS 112

21	4,704,973
121.12	4,704,974
238	4,704,975
262.2	4,704,976
266.1	4,704,977
275	4,704,978

CLASS 114

98	4,704,979
	4,704,980
218	4,704,981
304	4,704,982

CLASS 116

276	4,704,983
287	4,704,984

CLASS 118

316	4,704,985
318	4,704,986
500	4,704,987
726	4,704,988

CLASS 119

1	4,704,989
4	4,704,990
73	4,704,991

CLASS 122

4 D	4,704,992
21	4,704,993
32	4,704,994

CLASS 123

90.5	4,704,995
188 M	4,704,996
198 DB	4,704,997
271	4,704,998
299	4,704,999
357	4,705,000
417	4,705,001
440	4,705,002
449	4,705,003
491	4,705,004
500	4,705,005
506	4,705,006
519	4,705,007
557	4,705,008
571	4,705,009
575	4,705,010
589	4,705,011
	4,705,012
598	4,705,013

CLASS 124

1	4,705,014
24 R	4,705,015

CLASS 125

13 R	4,705,016
15	4,705,017

CLASS 126

39 E	4,705,019
39 N	4,705,018
41 R	4,705,020
	4,705,021
91 A	4,705,022

CLASS 128

4	4,705,023
11	4,705,024
24 A	4,705,026
25 B	4,705,028
43	4,705,029
69	4,705,030
92 YP	4,705,031
92 YY	4,705,027
92 YZ	4,705,032
153	4,705,025
201.13	4,705,033
204.21	4,705,034
303 R	4,705,035
303.1	4,705,036
305	4,705,037
	4,705,038
334 C	4,705,039
334 R	4,705,040
343	4,705,041
419 D	4,705,044
419 PG	4,705,043
419 PT	4,705,042
648	4,705,045
665	4,705,046
672	4,705,047
715	4,705,048
731	4,705,049
749	4,705,050

CLASS 132

79 A	4,705,051
85	4,705,052
88.7	4,705,053

CLASS 134

3	4,705,573
17	4,705,574
24	4,705,575
57 R	4,705,054
	4,705,055
111	4,705,056
180	4,705,057

CLASS 136

251	4,705,911
258	4,705,912
	4,705,913

CLASS 137

15	4,705,058
82	4,705,059
102	4,705,060
269	4,705,061
315	4,705,062
	4,705,063
384	4,705,064
484.6	4,705,065
486	4,705,066
487.5	4,705,067
512.1	4,705,068
596	4,705,069
614.21	4,705,070
625.17	4,705,072
625.25	4,705,073
625.3	4,705,071
625.46	4,705,074
625.47	4,705,075
883	4,705,076

CLASS 138

30	4,705,077
99	4,705,078

CLASS 140

3 CA	4,705,079
93 A	4,705,080
147	4,705,081

CLASS 141

4	4,705,082
104	4,705,083

CLASS 148

6.2	4,705,576
11.5 P	4,705,577
108	4,705,578
142	4,705,579
154	4,705,580
307	4,705,581

CLASS 149

92	4,705,582

CLASS 150

52 R	4,705,084
134	4,705,086

CLASS 152

5	4,705,087
209 R	4,705,088
400	4,705,089
417	4,705,090
541	4,705,091

CLASS 156

52	4,705,583
79	4,705,584

89 4,705,585
242 4,705,586
321 4,705,587
360 4,705,588
401 4,705,589
447 4,705,590
617 SP 4,705,591
630 4,705,592
635 4,705,593
637 4,705,594
643 4,705,595
4,705,596
4,705,597
4,705,598
653 4,705,599

CLASS 162

19 4,705,600
348 4,705,601
358 4,705,602

CLASS 164

34 4,705,092
97 4,705,093
426 4,705,094
433 B1 3,682,234
463 4,705,095
476 4,705,096

CLASS 165

4 4,705,097
4,705,098
12 4,705,099
40 4,705,100
104.31 4,705,101
104.33 4,705,102
110 4,705,103
149 4,705,104
151 4,705,105
179 4,705,106

CLASS 166

170 4,705,107
248 4,705,108
251 4,705,109
274 4,705,110
277 4,705,111
285 4,705,112
302 4,705,113
357 4,705,114

CLASS 171

16 4,705,115

CLASS 174

28 4,705,914
35 GC 4,705,916
35 R 4,705,915
52 FP 4,705,917
73 R 4,705,918

CLASS 175

19 4,705,116
65 4,705,117
4,705,118
92 4,705,119
99 4,705,120
325 4,705,121
329 4,705,122
410 4,705,123
4,705,124

CLASS 177

25 4,705,125
50 4,705,126
212 4,705,127

CLASS 178

19 4,705,919

CLASS 180

73.3 4,705,128
132 4,705,129
140 4,705,130
4,705,131
148 4,705,132
209 4,705,133
233 4,705,134
236 4,705,135
277 4,705,136

CLASS 181

120 4,705,137
212 4,705,138
290 4,705,139

CLASS 182

3 4,705,140
48 4,705,141
150 4,705,142
187 4,705,143

CLASS 185

40 R 4,705,144

CLASS 188

18 A 4,705,145
73.1 4,705,146
196 D 4,705,147

CLASS 192

8 R 4,705,148
58 B 4,705,149
70.2 4,705,150
111 A 4,705,151

CLASS 193

39 4,705,152

CLASS 194

277 4,705,153
319 4,705,154

CLASS 198

335 4,705,155
392 4,705,156
405 4,705,157
463.4 4,705,158
468.8 4,705,159
735 4,705,160
847 4,705,161

CLASS 200

43.04 4,705,920
50 B 4,705,921
61.45 M 4,705,922
144 B 4,705,923
331 4,705,924
340 4,705,925

CLASS 202

109 4,705,603

CLASS 203

67 4,705,604

CLASS 204

11 4,705,605
15 4,705,606
4,705,607
28 4,705,608
59 R 4,705,609
95 4,705,610
129.1 4,705,611
165 4,705,612
192.2 4,705,613
257 4,705,614
289 4,705,615
299 R 4,705,616
402 4,705,617

CLASS 206

45.11 4,705,162
45.32 4,705,163
98 4,705,164
253 4,705,165
309 4,705,166
329 Re.32,540
348 4,705,167
373 4,705,168
387 4,705,169
419 4,705,170
438 4,705,171
519 4,705,172
563 4,705,173
604 4,705,197
632 4,705,174

CLASS 208

44 4,705,618
112 4,705,619
146 4,705,621
206 4,705,620
289 4,705,622

CLASS 209

161 4,705,623

CLASS 210

96.1 4,705,624
110 4,705,625
130 4,705,626
264 4,705,627
289 4,705,628
340 4,705,629
361 4,705,630
403 4,705,631
500.23 4,705,632
614 4,705,633
616 4,705,634
633 4,705,635
638 4,705,636
670 4,705,637
710 4,705,638
720 4,705,639
733 4,705,640

CLASS 211

59.2 4,705,175
4,705,176
70.5 4,705,177
126 4,705,178

CLASS 212

182 4,705,179
190 4,705,180

CLASS 215

220 4,705,181
230 4,705,182
276 4,705,183

CLASS 219

10.55 B 4,705,926
4,705,928
10.55 E 4,705,927
4,705,929
68 4,705,931
69 V 4,705,932
121 LC 4,705,933
137 PS 4,705,934
211 4,705,935
295 4,705,936
492 4,705,930
497 4,705,937

CLASS 220

67 4,705,184
222 4,705,185
269 4,705,186
333 4,705,187
367 4,705,188
375 4,705,190
400 4,705,085
465 4,705,189

CLASS 222

80 4,705,191
144.5 4,705,192
146.6 4,705,193
192 4,705,194
207 4,705,195
439 4,705,196

CLASS 224

329 4,705,198

CLASS 226

95 4,705,199

CLASS 227

9 4,705,200
55 4,705,201
153 4,705,202

CLASS 228

119 4,705,203
179 4,705,204
180.2 4,705,205
183 4,705,206
194 4,705,207

CLASS 229

109 4,705,209
120.08 4,705,208

CLASS 235

380 4,705,211
435 4,705,938
466 4,705,939

CLASS 236

54 4,705,212

CLASS 237

7 4,705,213
12.3 C 4,705,214

CLASS 238

349 4,705,215

CLASS 239

18 4,705,216
125 4,705,330
142 4,705,217
271 4,705,218
397.5 4,705,219
585 4,705,210
654 4,705,220

CLASS 241

27 4,705,221
69 4,705,222
117 4,705,223

CLASS 242

35.6 E 4,705,224
56 R 4,705,225
4,705,226
59 4,705,227
84.2 G 4,705,228
86.52 4,705,229
107.4 A 4,705,230
130 4,705,231
150 R 4,705,232

CLASS 244

1 R 4,705,233
3.12 4,705,237
12.1 4,705,234
31 4,705,235
90 R 4,705,236
145 4,705,238
155 R 4,705,239
199 4,705,240

CLASS 248

27.3 4,705,241
48.1 4,705,242
51 4,705,243
68.1 4,705,244
74.3 4,705,245
97 4,705,246
98 4,705,247
99 4,705,248
101 4,705,249
164 4,705,250
171 4,705,251
178 4,705,252
219.4 4,705,253
287 4,705,254
317 4,705,255
418 4,705,256
611 4,705,257

CLASS 249

27 4,705,258

CLASS 250

56 B 4,705,957
201 4,705,940
4,705,941
227 4,705,942
231 SE 4,705,943
254 4,705,944
334 4,705,945
338 4,705,946
386 4,705,947
4,705,948
440.1 4,705,949
441.1 4,705,950
442.1 4,705,951
484.1 4,705,952
4,705,953
491.1 4,705,954
492.1 4,705,955
492.2 4,705,956
578 4,705,958

CLASS 251

61.1 4,705,259

CLASS 252

35 4,705,641
47.5 4,705,642
51.5 A 4,705,643
135 4,705,644
500 4,705,645
511 4,705,646
512 4,705,647
4,705,648

CLASS 256

37 4,705,262

CLASS 260

402 4,705,649
405.5 4,705,650
502.5 C 4,705,651
512 C 4,705,652

CLASS 261

111 4,705,653
128 4,705,654

CLASS 264

3.4 4,705,655
8 4,705,656
22 4,705,657
25 4,705,658
29.6 4,705,659
108 4,705,660

CLASS 266

78 4,705,260
287 4,705,261

CLASS 267

33 4,705,263

CLASS 269

17 4,705,264

CLASS 271

3 Re.32,541
122 4,705,265
264 4,705,266

CLASS 272

72 4,705,268
73 4,705,269
93 4,705,270
130 4,705,271
134 4,705,267
146 4,705,272

CLASS 273

72 R 4,705,273
148 R 4,705,274
309 4,705,275
4,705,276

CLASS 277

134 4,705,277
235 B 4,705,278

CLASS 279

1 L 4,705,279

CLASS 280

40 4,705,280
47.12 4,705,283
47.13 R 4,705,281
47.37 R 4,705,282
242 WC 4,705,284
279 4,705,285
281 R 4,705,286
289 WC 4,705,287
405 R 4,705,288
414.1 4,705,289
604 4,705,290
609 4,705,291
641 4,705,293
660 4,705,292
711 4,705,294
754 4,705,295
806 4,705,296

CLASS 281

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CLASS 282

11.5 A 4,705,298

CLASS 283

68 4,705,299
91 4,705,300
105 4,705,301

CLASS 285

47 4,705,302
243 4,705,304
309 4,705,303
311 4,705,305
332 4,705,306
332.3 4,705,307

CLASS 292

108 4,705,308
342 4,705,309

CLASS 294

1.4 4,705,310
2 4,705,311
62 4,705,312
94 4,705,313
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CLASS 296

37.1 4,705,315
37.6 4,705,317
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CLASS 297

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4,705,319

CLASS 299

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81 4,705,321

CLASS 303

116 4,705,323
119 4,705,324

CLASS 305

35 R 4,705,325

CLASS 307

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149 4,705,960
228 4,705,961
247.1 4,705,962
257 4,705,963
278 4,705,964
279 4,705,965
296 R 4,705,966
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456 4,705,968
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600 4,705,970

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12 4,705,971
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162 4,705,975
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235 4,705,977
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313 A 4,705,979
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324 4,705,981
356 4,705,982

CLASS 312

221 4,705,326
312 4,705,327
330 R 4,705,328

CLASS 313

318 4,705,984
449 4,705,985
487 4,705,986
634 4,705,987

CLASS 315

4 4,705,988
39.51 4,705,989
39.55 4,705,990
209 R 4,705,991
383 4,705,992
408 4,705,993

CLASS 318

16 4,705,994
129 4,705,995
160 4,705,996
341 4,705,997
376 Re.32,543
444 4,705,998
568 4,705,999
4,706,000
4,706,001
4,706,002
4,706,003
4,706,004
603 4,706,005
640 4,706,006
687 4,706,007
696 4,706,008

CLASS 320

22 4,706,009

CLASS 323

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274 4,706,011
280 4,706,012
316 4,706,013

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61 P 4,706,014
64 4,706,015
73 PC 4,705,329
102 4,706,016
127 4,706,017
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4,706,019
238 4,706,020
242 4,706,021
243 4,706,022
309 4,706,023
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4,706,026
4,706,027
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321 4,706,029
322 4,706,030
337 4,706,031

CLASS 328

1 4,706,032
139 4,706,033
151 4,706,034

CLASS 330

156 4,706,035
253 4,706,036
271 4,706,038
297 4,706,039

CLASS 331

1 A 4,706,040
52 4,706,041
94.1 4,706,042
4,706,043
113 R 4,706,044
117 FE 4,706,045
155 4,706,046

CLASS 332

19 4,706,047

CLASS 333

32 4,706,048
110 4,706,049
205 4,706,050
212 4,706,051
219 4,706,052
229 4,706,053

CLASS 335

192 4,706,056
203 4,706,054
229 4,706,055
248 4,706,037
284 4,706,057

CLASS 336

96 4,706,058

CLASS 337

297 4,706,059

CLASS 338

20 4,706,060
34 4,706,061
172 4,706,062

CLASS 340

60 4,706,063
63 4,706,064
303 4,706,065
347 DA 4,706,066
365 R 4,706,067
365 S 4,706,068
508 4,706,070
541 4,706,069
568 4,706,071
576 4,706,072
639 4,706,073
709 4,706,074
726 4,706,075
4,706,076
728 4,706,077
735 4,706,078
799 4,706,079
825.02 4,706,080
825.03 4,706,081
825.06 4,706,083
825.31 4,706,084
825.5 4,706,082
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902 4,706,086
908 4,706,087

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CLASS 346

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139 C 4,706,097
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160 4,706,099

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3.73 4,705,344
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96.15 4,705,347
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341 4,705,359
344 4,705,360
350 S 4,705,345
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CLASS 352

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CLASS 354

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14 SH 4,705,393

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376 4,705,401
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74 4,706,105
78 4,706,106

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99 4,706,119
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142 4,706,121
144 B1 4,048,654
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213.19 4,706,123
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257 4,706,126
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343 4,706,134

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760 4,706,211
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120 4,705,414
124 4,705,415
144.2 4,705,416
235 4,705,417

CLASS 401

15 4,705,418
65 4,705,419
145 4,705,420

CLASS 403

2 4,705,421
60 4,705,422
254 4,705,423
266 4,705,424
376 4,705,425

CLASS 404

6 4,705,426

CLASS 405

36 4,705,427
79 4,705,428
128 4,705,429
227 4,705,430
267 4,705,431

CLASS 406

60 4,705,432
63 4,705,433

CLASS 407

114 4,705,434

CLASS 408

59 4,705,435

72 R 4,705,436
139 4,705,437

CLASS 409

132 4,705,438
136 4,705,439
233 4,705,440

CLASS 411

188 4,705,441
510 4,705,442

CLASS 414

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70 4,705,451
173 4,705,443
226 4,705,444
280 4,705,445
422 4,705,446
462 4,705,448
590 4,705,447
687 4,705,450

CLASS 415

115 4,705,452
119 4,705,453
197 4,705,454

CLASS 416

97 R 4,705,455

CLASS 417

7 4,705,456
22 4,705,457
46 4,705,458
53 4,705,459
266 4,705,460
387 4,705,461
395 4,705,462
407 4,705,463
477 4,705,464

CLASS 418

23 4,705,465

CLASS 420

18 4,705,664

CLASS 422

12 4,705,665
16 4,705,666
68 4,705,667
82 4,705,668
93 4,705,669
186.04 4,705,670
189 4,705,671

CLASS 423

3 4,705,672
229 4,705,673
277 4,705,674
326 4,705,675
567 A 4,705,676

CLASS 424

1.1 4,705,677
4,705,678
52 4,705,679
55 4,705,680
70 4,705,681
4,705,682
81 4,705,683
88 4,705,684
89 4,705,685
92 4,705,686
95 4,705,687
122 4,705,688

CLASS 425

6 4,705,466
7 4,705,467
116 4,705,468
117 4,705,469
148 4,705,470
195 4,705,471
261 4,705,472
549 4,705,473

CLASS 426

2 4,705,689
590 4,705,690
4,705,691
607 4,705,692
629 4,705,693

CLASS 427

2 4,705,694
3 4,705,695
14.1 4,705,696
36 4,705,697
53.1 4,705,698
54.1 4,705,699
110 4,705,701
180 4,705,702
239 4,705,703
389.9 4,705,704

CLASS 428

13 4,705,705

17 4,705,706
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4,705,708
36 4,705,709
92 4,705,710
141 4,705,711
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252 4,705,717
323 4,705,718
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365 4,705,722
375 4,705,723
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653 4,705,727

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CLASS 430

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57 4,705,730
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138 4,705,736
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385 4,705,743
505 4,705,744
4,705,745
538 4,705,746
550 4,705,747

CLASS 432

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238 4,705,475

CLASS 433

171 4,705,476

CLASS 434

24 4,705,477
215 4,705,478
335 4,705,479

CLASS 435

7 4,705,748
15 4,705,749
68 4,705,750
4,705,751
106 4,705,752
180 4,705,753
287 4,705,754
316 4,705,755

CLASS 436

64 4,705,756
172 4,705,757
504 4,705,758

CLASS 437

29 4,705,759
32 4,704,786
40 4,704,783
41 4,704,784
110 4,704,785
231 4,705,700
234 4,705,760

CLASS 439

33 4,705,480
69 4,705,332
71 4,705,333
133 4,705,335
210 4,705,334
260 4,705,338
277 4,705,339
387 4,705,331
395 4,705,340
399 B1 4,385,794
417 4,705,481
460 4,705,482
502 4,705,483
4,705,484
544 4,705,341
595 4,705,337
597 4,705,336
650 4,705,342
669 4,705,485

CLASS 445

17 4,705,486

CLASS 446

290 4,705,487
393 4,705,488

CLASS 455

608 4,706,299
619 4,706,300

CLASS 464

69 4,705,489
132 4,705,490
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CLASS 474

49 4,705,492
69 4,705,493
109 4,705,494
255 4,705,495

CLASS 493

320 4,705,496

CLASS 501

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4,705,762
103 4,705,763

CLASS 502

62 4,705,764
152 4,705,765
167 4,705,766
4,705,767
213 4,705,768
241 4,705,769
242 4,705,770
255 4,705,771
303 4,705,772
402 4,705,773

CLASS 503

207 4,705,774
218 4,705,775
220 4,705,776

CLASS 514

12 4,705,777
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27 4,705,779
54 4,705,780
85 4,705,781
150 4,705,782
180 4,705,783
202 4,705,784
211 4,705,785
252 4,705,786
254 4,705,788
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259 4,705,787
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275 4,705,792
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423 4,705,801
438 4,705,802
450 4,705,803
474 4,705,804
530 4,705,806
548 4,705,805
650 4,705,807

CLASS 521

30 4,705,808
62 4,705,809
86 4,705,810
88 4,705,811
92 4,705,812
4,705,813
159 4,705,814
160 4,705,815

CLASS 523

132 4,705,816
152 4,705,817
200 4,705,818
351 4,705,819

CLASS 524

381 4,705,820
407 4,705,821
425 4,705,822
474 4,705,823
612 4,705,824
732 4,705,825
860 4,705,826

CLASS 525

67 4,705,827
232 4,705,828
240 4,705,829
333.4 4,705,830
426 4,705,831
436 4,705,832
504 4,705,833
540 4,705,834

CLASS 526

116 4,705,835
318.1 4,705,836

CLASS 528

31 4,705,837
48 4,705,838
49 4,705,839
53 4,705,840
59 4,705,841
88 4,705,842
212 4,705,843
275 4,705,844

CLASS 530

305 4,705,845
332 4,705,846
350 4,705,847
399 4,705,848

CLASS 534

14 4,705,849

CLASS 536

1.1 4,705,850

CLASS 540

215 4,705,851
301 4,705,852
490 4,705,853

CLASS 544

41 4,705,854
370 4,705,855

CLASS 546

21 4,705,856
65 4,705,857
112 4,705,858
345 4,705,859
347 4,705,860

CLASS 548

178 4,705,861
215 4,705,862
262 4,705,863
309 4,705,864
341 4,705,865
549 4,705,866

CLASS 549

39 4,705,867
215 4,705,868
317 4,705,869
369 4,705,870
417 4,705,871
448 4,705,872
494 4,705,873
557 4,705,874

CLASS 556

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149 4,705,876
422 4,705,877
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194 4,705,879
257 4,705,880
338 4,705,881

CLASS 560

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25 4,705,883
109 4,705,884
158 4,705,885
159 4,705,886
190 4,705,887
302 4,705,888

CLASS 562

406 4,705,890
491 4,705,891
562 4,705,892
564 4,705,889
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CLASS 564

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445 4,705,897
467 4,705,898

CLASS 568

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922 4,705,903

CLASS 570

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CLASS 585

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262 4,705,906
415 4,705,907
500 4,705,908
828 4,705,909

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6 4,705,498
9 4,705,499
35 4,705,500
43 4,705,501
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50 4,705,503
75 4,705,504
80 4,705,505
81 4,705,506
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113 4,705,508
154 4,705,509
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282 4,705,511
332 4,705,512
361 4,705,513
383 4,705,514
892 4,705,515

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12 4,705,517
14 4,705,518
16 4,705,519
23 4,705,520

CLASS 800

1 4,705,910

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D6— 301 292,651
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360 292,654
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462 292,657
465 292,658
468 292,659
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22 292,666
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359 292,669
382 292,670
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D19— 25 292,715
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92 292,718
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177 292,725
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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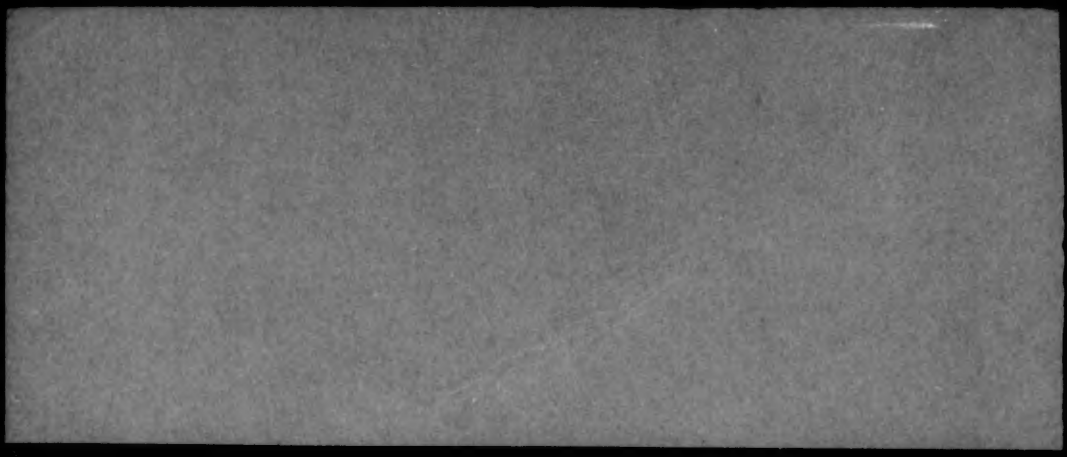

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